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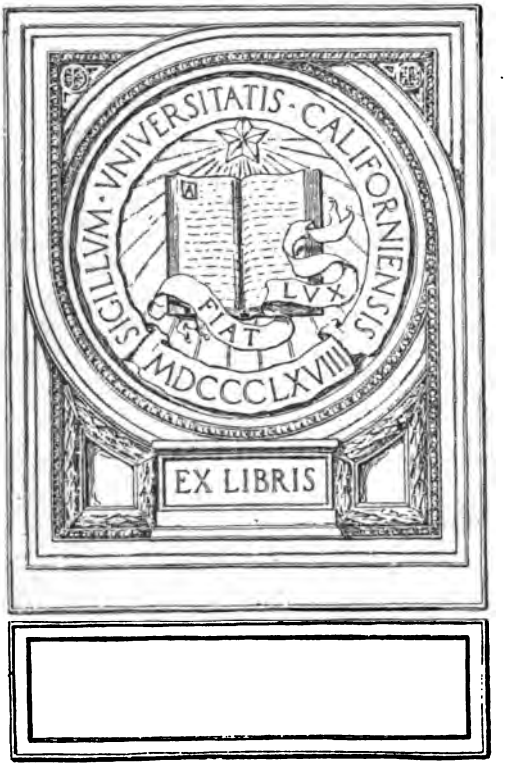
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VOCATIONAL EDUCATION

BY

DAVID SNEDDEN

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1920

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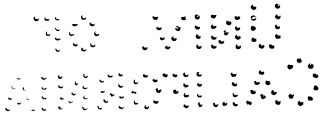

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PREFACE

THIS book is devoted primarily to a discussion of current problems in vocational education. Space has not been given either to historical surveys or to descriptions of contemporary achievements. Vocational education as a conscious social enterprise constitutes, except in professional fields, a long new chapter in social and educational evolution. Its literature is still largely a literature of aspirations, of shadowy ideals, and of scattered and poorly supported experiments.

But the great social movements of our time have finally brought to us unmistakable demands for democratic and efficient systems of vocational education. Heretofore such school vocational education as we have had has been aristocratic — "for the leaders" it was claimed; and non-school vocational education has been haphazard, unorganized, and deplorably lacking in efficiency.

What we call the "contemporary movement for vocational education" is in stark simplicity the result of an enormous social demand for schools for the vocational education of the rank and file of workers. Schools of professional education for the training of leaders we have long had; but corporate effort has, until almost yesterday, balked at the problem of providing training schools for workers who toil in the unexalted callings of mine, farm, forest, shop, factory, shipboard, and home.

Hence the new movement must first of all be interpreted as an expansion — and a tremendous one — of the purposes of education by means of those specialized agencies which we collectively designate as schools. It may be that to the philosopher the shadowy ultimate objectives of education

can be expressed by such "omnibus" terms as salvation, grace, moral perfection, physical fitness, social efficiency, the self-realization of the individual, the strong servant of the commonwealth, and those other interchangeable terms which constitute the currency of vague, speculative thinking; but the age is demanding more specific and more objective interpretations of the ends we seek.

As we endeavor to translate aspirations into concrete ideals and working programs endless problems arise. Some of these are problems of meaning; what, after all, do we actually mean and intend by vocational education? Under what conditions and to what extent is it different from non-vocational education? Some are problems of aim; is society expected to provide schools for all possible forms of vocational education? In the case of any given vocation what are desirable limits to school directed training, instruction, and idealization? Then there are fundamental problems of method and of administration; having once determined *what* we seek, how shall we proceed to reach our goals?

As far as practicable, therefore, the writer has addressed his efforts primarily to analysis of these problems. He has deliberately minimized or omitted discussions of those matters as to which substantial agreements seem to have been reached. Critical readers may feel that he has over-emphasized controversial issues; but the writer has believed such emphasis desirable at this time. In dealing with these issues he has usually had two distinct ends in view; first, to analyze the essential factors of the problem; and, second, to state his own hypothetical surmises and conclusions.

There can be no helpful vocational education that does not rest on a sound system of economics. The painful years are showing us how little legislators, business men, labor leaders, and educators know of the enduring laws of economics and how, out of the soil of this ignorance, rank poisonous plants of fantastic creed and malevolent purpose may

easily grow. The ignorance of the citizenry of to-day, confronted by the endless economic problems produced by modern conditions of production, is comparable to that of the primitive natives in Mediterranean countries and later in North America when the currents of commerce sowed wide the seeds of the bubonic and other plagues. But there are few current economic problems which do not intimately affect, and are not intimately affected by, vocational education. Man must produce economic goods if he is to live; he must produce them well and efficiently if he is to live well and efficiently; and he must be trained long and exactingly if he is to produce efficiently. As far as present conditions of thought permit, the writer has tried to hold up for consideration in the background the most pertinent of the economic problems underlying vocational education.

The conditions under which this book has been written have rendered unavoidable a few major, and a larger number of minor, repetitions. But it is expected that a considerable number of readers will not desire to follow the text as a whole, but instead, to study sections dealing with particular problems. For them the repetition of certain fundamental considerations may prove an advantage. The indulgence of the reader is asked also in the matter of bibliographical references. Of substantial bibliographical material in book form vocational education has little indeed. The bibliographies listed on pp. 513–14 are largely of articles and other materials of a more or less transient nature.

DAVID SNEDDEN.

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UNIV. OF CALIFORNIA

VOCATIONAL EDUCATION

CHAPTER I

THE MEANING OF VOCATIONAL EDUCATION

I

Some Definitions Illustrated. — For the purposes of this book, the word "vocation" will be taken in the sense of "calling," "chief occupation," or primary "gainful pursuit." It can be assumed that every adult in possession of his natural powers renders to the world some form of service, in return for which he receives the services (or the products of the service) of others. To the rendering of this service, each adult usually devotes definite portions of his time and energy. He tills the soil, weaves cloth, keeps books, commands soldiers, teaches, writes poetry, drives a locomotive, superintends a factory, digs coal, heals the sick, cleans the streets, or keeps a home. For the services thus rendered steadily in the one or the other of these fields his fellows pay him with portions of the results of their service, money, of course, serving only as a convenient measure and means of making such payment.[1]

[1] The man who lives by purely predatory activities exacts goods from others without rendering an equivalent; but such conduct is, of course, under the ban of society. So is beggary and other forms of getting, without giving, service.

A man who owns capital and keeps it invested is thereby rendering a service to society, since most forms of production require capital. But a man owning much capital may elect to render no other service except

Any adult may have other occupations besides his vocation; but, commonly, he does not pursue these as primary means of obtaining a livelihood, or of producing sufficient "goods" wherewith he can purchase what he desires of the goods produced by others. These "side" occupations or avocations he may pursue for amusement, — they constitute often the play of men; or he may pursue them as a means of health; or he may discharge through them those non-vocational obligations which he owes to society, — that is, to the family, the church, the party, the state, the nation, — as parent, citizen, worshiper, defender. But in no case are these activities properly vocations; etymologically and logically they are *avocations* — to be pursued outside the hours customarily dedicated to his vocation. Hence, it is not consistent with the usage accepted in this book to speak of parenthood or citizenship or military reserve service or amateur sport as "vocations."

Kinds of Vocations. — Vocations, of course, may be manual or intellectual; the worker may be called chiefly to lead and to give orders, or to follow and to take orders.

through keeping his capital in active use. For convenience we may assume that his vocation is that of "investor."

In superficial writing it is sometimes assumed that only "labor" (meaning thereby manual labor) is productive. This, of course, is playing with words. For our purposes, any human effort that results in "goods" valued for human utilization will be called productive service. Hence the soldier who defends the flag, the artist who paints an attractive scene, the explorer who reveals new regions, the enterpriser (or entrepreneur) who dares to start a new enterprise, the actor who entertains, the mother who gives her best effort to rearing children, and the banker who creates storage reservoirs and "canal" systems whereby capital can be gathered and set to work like irrigating water, are all contributing productive service no less than the farmer, the miner, and the factory operative.

In the sense used here children, as well as decrepit and defective adults, do not render productive service. They may, by their growth or presence, add to the spiritual wealth of the community, but they do not have, usually, productive vocations and they therefore consume but do not add to economic wealth.

There are vocational classes in which the service rendered to society is frequently not to be measured by the material return which society or individuals within it give. We think of priests, teachers, artists, inventors, leaders of forlorn hopes, physicians, devoted soldiers, as all coming more or less within these classes. But the differences between highest and lowest workers is chiefly one of degree rather than of kind, as respects value of service rendered and the spirit in which it is rendered. We can distinguish vocational groups in which the workers are strongly actuated by devotion to the service of the larger human groups; others in which desire for gain and approval chiefly lead men on; and still others in which the primitive emotions of fear, — fear of hunger, fear of poverty, fear of the blows of the slave driver, — force men to work that is often irksome and repellent.

Superficially considered, some vocations seem to be "harder" than others, in the sense that fewer persons can be found willing to undertake or discharge them. We assume that only mature, well-selected, and well-trained men can be physicians, generals, locomotive engineers, writers, directors of enterprise. The differences between the high and low, the well rewarded and the poorly rewarded, vocations are in reality the products of social valuations of the service rendered. Intrinsically, it is probably no harder to try to heal the sick, paint pictures, lead a regiment, plan a house, or teach the young than to dig a ditch, sweep a street, operate a typewriter, or weed a garden; but the standards of service exacted by society differ in these fields so greatly that for certain kinds of healing, painting, commanding, planning, and teaching only the services of individuals of rare native ability and elaborate training are acceptable, whereas very ordinary persons, even if untrained, can render acceptable service in the other fields. Except, then, for certain specialized kinds of service, — *e.g.* invention, oper-

ation of complicated machinery, — where only the person of unusual gifts and training can accomplish anything at all, it can safely be assumed that the " difficulty " of a given vocation as currently conceived is largely a reflection of the valuations attached by society to the services rendered in and through it. These valuations change, of course. Teaching is frequently left to those of least ability and preparation, but occasionally a man of trained talent is sought and rewarded grandly. Defenders, healers, cooks, painters of pictures, writers of verse, rearers of children — all these follow vocations which at certain times have been depreciated, despised, and given over to the weak and the untrained; while under other conditions they have been exalted and well rewarded, held as the prizes for the fortunate ones whom nature has gifted and society carefully prepared.

The Variability of Workers. — Men vary greatly in their respective abilities to produce valuable service within each vocation. The causes of these variations, in so far as they are not due to external conditions, — character of tools used, supervision, etc. — are to be found in the native ability, experience, training, health, and morals of each of the workers. The bases for all successful productive work, — hunting, defending, tilling, herding, fabricating, teaching, healing, leading, — are to be found, of course, in certain inherited qualities of nervous system, bone, muscle, and sense organs. These give valuable kinds of strength, endurance, agility, sensitiveness, and a wide range of intellectual and moral powers and qualities.

The prolonged exercise of these qualities, in the human, no less than in the animal, world, tends towards their improvement. Within limits, skill, technical knowledge, satisfaction with results of effort, and appreciation of the social significance of work done, grows with the prolonged exercise of native powers called for by a vocation.

But to this growth, due to practice and experience, must be added the equally important growth in vocational powers due to the worker's gradual absorption of the stored and communicated results of the experience of others — forerunners as well as contemporaries. It is in this respect peculiarly that, in the exercise of productive activities, man so immeasurably surpasses the animals. The success of the animal in the natural state depends upon inherited powers and individual experience alone, including instincts of coöperation, while the success of human beings is achieved largely upon the basis of the individual experience of uncounted numbers of others, communicated by language and otherwise. Back of nearly every vocation as carried on to-day, is a vast social inheritance of discoveries, tested devices, organized technical knowledge, and methods of coördinating the efforts of many.

The Acquisition of the Social Inheritance belonging to any vocation may be, for a given individual, an unsystematized and accidental matter, or it may be definitely organized and regulated. Certain instincts, powerful in youth, and probably never wholly dormant, — curiosity, imitation, ownership, workmanship, competition for approval or ascendancy, as we may roughly name some of them, — impel the worker to glean from all his associates and from the products of human effort which surround him, the available fragments of the social inheritance of vocational devices, customs, knowledges, and ideals. In more advanced stages he finds these compacted in books, models, diagrams, formulæ, and the like.

The process of appropriating the social inheritance peculiar to a given vocation may consist, so far as a given learner is concerned, largely of the accidental or partial learning which takes place as an accompaniment to actual participation in work itself, in progression from its more elementary to its more advanced stages; or it may be highly

organized for a definite period. In the first case, the person (usually youth or young worker) is primarily engaged in productive work, and as a kind of by-product of that he accumulates, in addition to the results, which are due solely to his own enlarging experience, a large body of knowledge, devices, "tricks of the trade," etc. from his fellows and directors. In the second case, he is primarily engaged in learning how to become productive, his productive work being for the present a secondary consideration. There was a time when a boy became a physician by serving as an apprentice to a practitioner. Almost from the outset, the novice was expected primarily to make himself useful — to assist the healer; but, as a secondary object of both master and apprentice, he was expected to learn from the elder the "arts of healing," the secrets of *materia medica*. To-day, in the cab of the locomotive engineer, is found a helper whose chief duty is to feed the fires, but who is expected incidentally to learn the arts and to acquire the skill required to later become himself a locomotive engineer.

Direct Vocational Education for the Professions. — Society has in large part su[redacted]ted direct vocational education for the indirect educa[redacted](by-education) of apprenticeship in the training of the physician; but it has done nothing of the kind yet in the training of the locomotive engineer. The youth, aspiring to the practice of medicine, now spends several years with the one object of mastering the accumulated knowledge and the arts of his proposed profession. He may, as interne in a hospital, still serve a period of quasi-apprenticeship; but he does so only after he has equipped himself substantially to the point where he could enter upon productive work on his own account. It is clearly within the bounds of possibility that the locomotive engineer will yet be educated directly for his calling in specially equipped and staffed schools, as are physicians, or in a more nearly related field, chauffeurs, to-day.

The foregoing review of some of the more elementary facts of social science has been essential to bring into relief certain fundamental conditions affecting vocational education. The relative productive capacity of individuals (their first measure of vocational success) has many sources among which the most distinguishable and important are: heredity; the nurturing effects of environment; the by-education of play, miscellaneous occupations and general education; the by-education of novice or apprenticeship participation in the early stages of the vocation itself; and direct vocational education for a specific calling.

II

Vocational By-Education. — It is clear that all purposeful or partially purposeful processes by which one individual promotes the vocational capacity of another should be regarded as vocational education, broadly considered. Using the term in this sense, it is also evident that substantially all adult persons at all times have received some vocational education. We can, for any given vocation, in any given period, distinguish between different kinds of vocational education as: direct or indirect; good or bad; fragmentary or complete; concrete or abstract; publicly directed or left wholly to private effort; and rationally conceived or resting wholly on custom.

Similarly, we must recognize that more or less good or bad vocational education has been involved in the cases of: the youth in primitive society learning the use of bow and arrow from uncle, father, or other (usually older) associate; the boy on shipboard "picking up" the arts of the sailor; the farmer's boy learning through his tasks as helper to be in turn a farmer; the girl, assisting her mother to execute the numberless arts underlying preparation of food, clothing, and shelter; the apprentice bound out to a master

for a series of years "to learn a trade"; the student in the college of law, medicine, or dentistry; the young man entering a bank "at the foot of the ladder," and by combination of direct practical experience and outside study fitting himself eventually for the presidency of the institution; the prospective teacher training for her work in a normal school; the teacher using his practical experience and supplemental study as a means of fitting himself for a superintendency; an immigrant, without knowledge of, or skill with, machinery, placed in a machine shop and directed by the boss in the operation of a particular machine towards the performance of particular processes; and the innumerable other forms of adjustment whereby at all times the immature, untaught, and unready are nevertheless led, helped, or forced on towards specialized forms of competency for productive work.

For the purposes of this book, a fundamental distinction must at once be made between direct and indirect vocational education. The latter form will usually be described as *vocational by-education* for the reason that such education is a by-product of activities designed primarily for other purposes. *Direct vocational education* obviously includes only those forms in which training for a specified vocation is the primary, central, and controlling purpose, and in which production, recreation, control, etc., are all regarded as secondary, minor, or incidental purposes. The student in the medical college is expected to devote his chief efforts, not to the productive practice of medicine, but to learning or otherwise preparing to practice medicine. The use made of his time, the exercises and studies he undertakes, the equipment placed at his disposal, are all designed primarily to accomplish definitely conceived purposes of vocational education.

An agency for direct education of any sort is usually called a school. Farms, homes, shops, offices, boats, mines,

and the like are primarily agencies for productive work and not for education. A vocational school may and should do productive work as a secondary objective, but such productive work is an incidental thing, a by-product; the other agencies named often produce education, but that is necessarily, for them, a by-product.

It is now clear that at all times in the past and even yet the great bulk of the world's vocational education has been, and is, essentially by-education. The learner has "learned to do by doing" and his doing has been addressed directly to the task of producing valuable service or goods. Even under the highly organized apprenticeship systems of the Middle Ages, the novice was, from the standpoint of his master, engaged primarily in producing. The apprentice, and particularly the father of the apprentice, who had, perhaps, paid a substantial indenture fee, probably conceived of the education to be received as the really valuable outcome; but it remained true, nevertheless, that as regards the disposition of the learner's time, the use of equipment and materials by him, and the gradation of tasks assigned, production was the primary, and vocational education the secondary, end.

III

Direct Vocational Education. — In point of evolutionary development, the vocational school succeeds to processes of vocational by-education in home, shop, farm, office, shipboard, camp, and road as inevitably as does the school for literary, religious, artistic, civic, or physical education when unspecialized agencies, having these as secondary purposes, prove inadequate to the advancing needs of society. The home once taught reading and writing as by-products of its normal or primary activities (nurture and protection, so far as children were concerned). But the home was always a poor agency through which to insure the necessary minimum of reading and writing. First private schools,

then endowed schools, and finally, public schools, came into existence to insure the effective teaching of these necessary branches.

Similarly, the methods of apprenticeship once apparently sufficed to give the instruction and training necessary to those who were to practice the arts of healing with their associated magic and other subsidiary arts. But it long ago became apparent that the methods of apprenticeship were insufficient to prepare healers of the kind sought or required by society under more advanced conditions. The need was first met by medical apprentices' courses of lectures in which successful practitioners expounded principles and imparted the information built up through experience. These were gradually succeeded by schools of medicine which presupposed no apprenticeship, but which, building on foundations of a prolonged general education, laid broad foundations of scientific knowledge and completed the structure of medical education by directed practical experience to be obtained through clinical demonstration and hospital practice supervised by experts.

Thus have come into existence vocational schools for the training of engineers, lawyers, teachers, priests, dentists, war leaders, architects, pharmacists, stenographers, bookkeepers, accountants, machinists, printers, cooks, barbers, and the like. Sometimes the occupation is so modern and technical that a state of apprenticeship has never developed, — *e.g.* stenography. Sometimes the methods of the vocational school in selecting talent and training it are from the outset so acceptable that apprenticeship quickly falls into disuse when the product of the vocational school becomes available, — *e.g.* the engineering professions in France, Germany, and America. In many cases, owing to poor educational methods in vocational schools or to the slow development of appreciation of their work outside, a long period intervenes between the establishment of voca-

tional schools and the widespread acceptance of those trained in them as having superior qualifications. American normal schools have had to wage a long and hard campaign to have their product generally accepted even as of equal merit with persons just graduated from secondary schools of general education. Private trade schools have been repeatedly condemned because their graduates have, as alleged, not only not learned their trades properly, but have in serious respects been disqualified to learn them through the routine of apprenticeship subsequently. The extent to which American agricultural colleges have justified the investment made in them as respects the training of men to be successful farmers is still debated (it is not questioned that they have been successful in training agricultural investigators, soil analysts, and other specialists). Private so-called business and commercial schools for many years exploited the ambitions of young Americans to become successful business leaders; and to-day literally hundreds of thousands of youths of both sexes are found in public and private commercial schools seeking what appeals to them as a valuable vocational education. That the instruction and training they receive actually functions profitably as vocational competency in any but one commercial calling, is openly questioned even by educators. But the success of these quasi-vocational or alleged vocational schools in attracting students is eloquent testimony of the prevailing popular belief, on the one hand, in the inadequacy of commercial by-education as received in commercial callings themselves, and on the other, of the possibilities of providing effective vocational schools for these fields.

Intermediate Forms. — It is clear that between direct vocational education and vocational by-education certain hybrid forms can be recognized. In a shop, for example, a foreman may for several days devote himself primarily to teaching a new recruit. During this time, production

must be regarded as an incident to the teaching process. In factories or commercial establishments, a recently employed man may be required to serve a period without pay, it being assumed by both parties to the arrangement that the productive service rendered does not more than compensate for the education made available. Occasionally, novices will be found in the offices of architects, lawyers, and engineers, or in hospitals, who are contributing productive service indeed, but for whom the primary purpose is some form of vocational education.

Then, too, we must recognize the existence of numerous schools whose function is not to give the entire vocational education as required for the exercise of a calling, but to provide one necessary ingredient in it. A man seeking to qualify for the position of farm implement salesman in Brazil may obtain instruction in Portuguese in a school of languages. An apprentice in a machine shop may obtain in evening school special technical training in some phase of drawing, mathematics, or mechanics.

These forms of vocational education, partially direct and partially indirect, require consideration in their individual forms. It is practically impossible to formulate generalizations regarding them. Usually they are in a state of flux. For example, short course instruction of telephone girls has been replaced in many cases by direct education in special schools for operatives, maintained by the telephone corporations. Evening technical instruction tends towards so-called "short unit" courses quite specifically integrated with the day experience and problems of the worker.

The first decade of the twentieth century has witnessed in America a rapidly growing interest in the possibilities of publicly supported vocational schools to serve prospective workers in the industries, agriculture, and home making. The sources and special manifestations of this interest will

be discussed elsewhere. Here, it is only necessary to note that in general, outside the professions and stenography, vocational schools yet play an insignificant part in supplying the vocational training required by the three to five millions of persons who annually enter the ranks of productive work in the shops, homes, offices, farms, camps, and railroads and ships of America. There are good reasons for believing that in many of the callings in these fields the efficacy of the by-education of apprenticeship or other participation is steadily diminishing, as a consequence of which there results a vast social wastage of human energy, happiness, health, and life. To trust to by-education is peculiarly characteristic of an age and social order strongly influenced by the doctrines of individualism and *laissez faire*. The prolonged maintenance of professional schools, private, endowed, or public, represents in some degree the outgrowth of beliefs in the desirability and possible efficacy of social or collective action. The spirit of the age is clearly away from *laissez faire* and towards collective action in vocational education.

IV

Origins. — The coming of vocational education in schools for the rank and file of workers has been dependent in the first place upon a social conviction, held at least by the thinkers, that the historic forms of vocational by-education no longer sufficed for modern needs. This conviction rapidly developed during the closing decades of the 19th century in the industries when it was clearly seen how the progress of manufacturing had broken down trade apprenticeship. It came when it was seen that in the agricultural occupations the old skills and customs must be replaced by new skills (the demands of machine farming among others) and scientific knowledge. In the commercial world it came

when the rapid evolution of new processes and needs showed the utter futility of trying to develop apprenticeship training for office and counting-house. And now, even in the elemental and primitive field of home making, the same conviction is growing, namely, that direct school training for this vocation will, in the long run, prove more effective and economical than the hit-and-miss processes of the by-education of the home itself.

There could, of course, be no genuine vocational education offered through schools until the public believed such schools to be practicable. It has taken nearly a century of blind experimentation, false starts, the pioneering efforts of philanthropists, and the speculations of educators and social workers to give us even our present body of imperfectly tested knowledge and theory as to the ways and means of training in, or under the direction of, special schools for even a few of the thousands of occupations that men and women — and even adolescent boys and girls, the juvenile workers — must follow.

Many of the difficulties historically encountered in trying to provide direct vocational education have been due to the fact that in their earlier stages almost no vocational schools have been designed to give both the skill and the knowledge required for the successful pursuit of a calling. The evening classes established by the Mechanics Institutes in our industrial cities nearly three quarters of a century ago were intended to supplement apprenticeship. The short *extension* courses in special forms of agricultural education which have long flourished in our agricultural colleges have usually presupposed a basis of hard practical experience already obtained in the University of Hard Knocks. The mechanical drawing and industrial art classes which spread rapidly after 1870 were in large part also forms of extension education. Even our earlier law and medical colleges — the work of which consisted chiefly

of courses of lectures given by able practitioners of these professions — were designed chiefly by persons who had already served an apprenticeship in the office of lawyer or physician.

Or else these earlier vocational schools were planned to teach the "principles" of a vocation, leaving "practice" to be acquired later in actual experience. The private schools of business practice which so widely exploited the credulity of the public after the Civil War, insisted, indeed, upon skill in handwriting; but for the rest, they taught the "principles" of bookkeeping, commercial arithmetic, commercial law, and the like, leaving practical wisdom and skill to be learned later through the hazardous by-education of office, salesroom, and road-canvassing. Modern commercial and business schools, with their hundreds of thousands of pupils, do indeed now teach quite successfully and in a basic way two commercial arts which are vocational chiefly for girls only — namely, typewriting and stenography. But for the great bulk of commercial vocations these schools can hardly be considered, as yet, vocational in any fundamental sense — perhaps the words "technical schools" best describe them. Like the commercial schools, our engineering colleges and their imitators, the "technical high schools," and also the agricultural colleges, have devoted themselves, not to the teaching of vocations in any practical sense, but rather to the attempt to teach those things so dear to the schoolmaster type of mind, to wit the "principles" or the supposedly essential mathematics, art, science, and "technical knowledge" of one or several vocations. Only slowly and reluctantly are these schools adding to their courses "field work," "practical work," "shop experience," and other forms of "learning through doing" — and at first these are required only in the vacations and marginal hours. The pedagogical effectiveness of a system of vocational education divided between earlier technical school study and

later practical experience in the world of actual work is one of the big subjects for future investigation. For very many learners the values of this form of "cold storage" of the "principles" of vocational knowledge long in advance of practical application may be very much doubted. (An interesting contribution in this field is the recent Carnegie Foundation "Report on Engineering Education.")

It is now fairly clear that for the industrial and farming callings as these must be practiced by the rank and file of workers, technical school education in advance of practical experience is of little value — in fact, educators of greatest insight have lately come to regard it as having some very bad after-consequences because, for the individual learner, it is apt to be illusory and unreal. The usefulness and large future possibilities of genuine extension education (that is, technical knowledge and special supplemental skills given to those already engaged in the practical pursuit of a calling) are, on the other hand, more obvious than ever, and undoubtedly good extension teaching for all vocations has a promising future.

The Modern Movement. — But what we now recognize as the modern movement for vocational education in schools begins with the recognition, on the one hand, that for nearly all industrial and farming callings, technical knowledge acquired in advance of practical experience is of little real value as vocational education; and, on the other, that the acquisition of practical experience in the occupation itself, to be supplemented later by "extension" education in evening school and short course, is acquired frequently under most unsatisfactory conditions.

This modern movement hardly dates back to the beginning of the present century, at least in America. The fundamental question presented to it and by it was this: How can society, by means of specially designed or adapted schools, insure integral or basal training for the numberless

special vocations in which men and women insure their own prosperity and through which the community and the nation themselves become strong and wholesome? How far can the state secure this vocational training without relying upon the unorganized and often incidental training given by master workman, foreman, employer, farmer, or parent?

To the schoolman the essential novelty of the situation thus presented consists in the requirement that facilities for the practice of the calling in some apparently practical way and under educational direction, shall be provided in, or under the immediate oversight of, the vocational school. No longer could the so-called vocational school consist only or chiefly of classrooms, desks, blackboards, and textbooks, reinforced by a sky-lighted room for drawing, a few basement rooms for laboratory or tool exercises, and a sun-room or green-house for plantwork. Not only must the new vocational schools, as proposed, have workshops, or farms, but it was even suggested in some quarters that the work done in these shops or on these farms ought to be somewhat like the real work done in the outside world. Visionaries began to talk about "productive work," a "marketable product," "quantity production," a "wage for the learners"!

All of these proposals looked very sensible to the practical man outside the schools, but to public school educators they were too revolutionary. He first resisted flatly, then, when forced by public opinion, and the results of experimentation carried on chiefly by private effort, he evaded, dodged, substituted, confused issues, and appealed to prejudices just like the devotees of any other profession which has heretofore rested largely on a basis of custom and tradition. (Reference is made, of course, to schoolmen in general; there have been some, perhaps many, shining exceptions.)

The last fifteen years, therefore, have been the toddling,

teething stage of growth of vocational education. It has naturally been subject to many of the diseases of childhood. At times it was not certain that the infant would live; and some have doubted whether it was worth raising. The present writer can say with good grace that it has been a noisy brat; and he is well aware that some of its foster nurses have made uninterested people rather tired by their predictions as to how the infant would some day become a lusty youth who would whip the other and less vulgar youths in the vicinity and even make some respectable older folks look to their laurels.

Since the whole-hearted entry of the national government into the support and partial direction of vocational education of the kinds here under discussion (especially under the provisions of the "Smith-Hughes" Act), the entire situation has assumed a new aspect. The infant is no longer regarded as a foundling and interloper. He is growing and learning fast. We can see now that, while he will not meekly confine himself to a corner, neither is he likely to become a bully, even if in a few cases he is given for a while the food and freedom of "dual control." He is really capable of being civilized, even though our refined schoolmaster senses will long object to the workaday clothing that he must perforce wear, and to the odors of machine shop and stable that necessarily cling to him.

V

The Future. — What of his probable future, during, let us say, the next twenty-five years of adolescence? It is well that we should strive to forecast this future, in order that we may plan for it intelligently. There are, therefore, submitted for preliminary criticism some more or less speculative predictions, expressed somewhat categorically for the sake of brevity.

1. Unquestionably, vocational education is destined to have an enormous growth in the near future. There are hundreds, if not actually thousands of callings for which the present methods of vocational by-education, unorganized, incidental, haphazard, are wofully inadequate, either for the good of the individual or for the good of society. For each of these we shall have appropriate vocational schools. From two to three hundred thousand young men each year recruit the ranks of the farmers of this country. Eventually, nearly all of these will have some special training for farming, both at the outset as basal or initial vocational education, and later as extension instruction or even extension training. Operatives in all kinds of factories, locomotive engineers, housewives, sailors, soldiers, farm laborers, postal clerks — all these and thousands besides, may be expected to precede their entry upon full-time wage earning by some very direct and positive vocational training during the months or years just preceding the assumption of that work; and, after beginning wage earning, they will in continuation, evening, or other type of extension school continue their education towards high forms of vocational competency.

2. Like all other forms of publicly supported education, vocational education will be organized and directed by representatives of the public, charged, among other things, with maintaining it at a high degree of efficiency, and also in a thoroughly democratic spirit. Usually the same board will direct all types of public education for a given area. But national aid, under constitutional provisions now existing, will have to be given without direct control; hence the national supervisory body (supervising expenditure of national money) will doubtless continue to be a special body *ad hoc*. Where one school serves an entire state or a large area — a medical college, a school of printing, a highly specialized school of farming, as *e.g.*, almond growing or

ostrich farming, a dental college, or a school of glass manufacture — it will probably have its special board, as is the case now often with normal schools, state technical schools, and schools for defective or delinquent classes, or it may be one of several types of schools to be governed by one state board. Each distinctive type of vocational education will necessarily have its own expert specialist direction, both locally and on behalf of the state. The bogy of "dual control," evoked chiefly by a few selfseekers on the one hand, or obscurantists on the other, will soon be downed. Pure dual control has nowhere existed; and such temporary examples of partial dual control as have prevailed have been due largely to the exasperation of practically all at the ignorance and "stand-pattism" of the academic pedant who has not infrequently been in control, as layman or salaried specialist, of the existing school machinery.

3. The natural first thought of parents and citizens with regard to what we call vaguely a vocational school is that it ought to be as accessible as the local public elementary school, or at least the neighboring high school. We hear school superintendents asking "what kind of vocational school should be provided in the small town?" This attitude, of course, is the product of our naïve and unanalytical thinking about vocational education and the very natural longings of uncritical folk — lay and specialist — that a "panacea" or "vocational simple" can be discovered that will fit all needs alike. It is this same quest after an "easy way" that has begotten our deep faiths in the possibilities of educational "simples" for training mind or character.

But study of the sober realities now convinces us that in many cases the mountain will not come to Mahomet. The youth seeking the vocational school will have to go to the Mountain. In such trades as plumbing, electrical work, pattern making, printing, house-carpentry, poultry-raising, optometry, and automobile repair, it is probable that in no

state can there be provided more than a few centrally located schools. For operatives in textile, shoe, pottery, and munitions manufacture; machine shop production; clothing making; food packing; and cigar making — to mention only a few manufacturing industries — special schools will naturally tend to be located in centers of these highly aggregating industries. Youths from rural areas or in cities where these industries are not found will simply have to leave home to get their desired vocational education in them. Eventually it may prove decided economy for the state to subsidize in part, towards their expenses of living and travel, those *bona fide* aspirants who must live away from home whilst getting needed vocational training. We may expect the development of scientific methods of vocational guidance in the near future to be such as to guarantee that the vocational choice, once made, will be followed up to the extent normal for that vocation.

4. One of the largest illusions now prevalent in vocational education is that a vocation, once entered upon by a young person, must be followed through life. The fact is that modern life is organized very much on a series of occupational levels, and the beginner naturally enters upon some level adapted to his immaturity and inexperience. No one seriously expects a girl of sixteen to be a school principal or a housewife; yet in many states more than half of all girls at sixteen have already entered upon full time wage earning in callings that are truly juvenile occupations. No one expects a youth of eighteen to be a locomotive engineer, a machine shop foreman, or a contractor. The man who is the typical farmer at the age of forty was probably a hired worker on a farm (his father's or another's) from sixteen to twenty-five, then a tenant or renter farmer and, in middle life, a farmer managing his own land and capital. In all our great manufacturing callings there exist sometimes scores of levels indicated by varying wage rates, and, to a

large extent, advancement from one to the other is effected on the basis of increasing maturity and experience, and would be greatly simplified and expedited if, preliminary to each new level, adequate specific vocational training could be provided. Even in the so-called skilled or "all-round" trades — which are almost everywhere undergoing an inevitable economic decline — the age of effective entry on apprenticeship is rising. Anciently in Europe it was in what we would now call childhood's years, and it is still as low as fourteen for many handicraft occupations followed in Central Europe. In America apprenticeship is rarely begun before sixteen, and in many cases eighteen is now preferred; yet many of those who must eventually become artisans are under necessity of contributing to their own self-support at the age of fifteen and onwards.

The vocational schools of the future — even those giving basic or initial full time vocational education — must be available not only in suitable varieties for those millions who are ready and eager for a period to enter upon juvenile vocations; no less, they must be available for those who are to pass from juvenile occupations to those available for persons in the early flush of manhood; and still again, when men and women, now mature and self-knowing, seek to pass to higher stages of their callings, to foremanship, or even to wholly different pursuits. Between twenty-two and twenty-five the typical American city-dwelling girl, after from three to seven years of wage earning, leaves behind her first vocation and follows thenceforward the vocation of homemaker. It may well be that in our best agricultural schools in the future we shall train the typical boy of from fifteen to eighteen to be a skillful farm employee; and that another type of school will be open to him at twenty-five when he is ready to become a managing, self-directing farmer.

5. It is now fairly obvious to all who have their eyes

open that effective vocational education for almost every calling must begin with the actual practice, in elementary stages, of that calling, on what is now called a productive basis; and that technical knowledge will be introduced and integrated with experience only as the progress of the productive work, organized, of course, primarily for educational purposes, renders that process intelligible and effective. This is the basis of the productive shop, the tests of "quantity production," the home project in farming and homemaking and the numerous part-time proposals all now being experimented with.

6. The writer is convinced that as soon as we really find ourselves in the pedagogy of vocational education we shall evolve and resolutely hold to the principle that learners engaged in productive work as an educational process shall receive in wages the net worth of their work — its total value, less a reasonable charge for interest, rent, overhead charges, direction (not including education), etc. The value of this wage for pedagogical purposes, as giving the learner a constant measure of the worth of his product — qualitatively and quantitatively — will be inestimable. Only in certain forms of part-time work, and in the well developed home project in agriculture, do vocational learners now realize a wage (or labor) return for their work. The process should be extended to all forms of basic (as distinguished from extension) vocational education. Even in home project homemaking (of which we see signs on the horizon), the home in which the girl works must accept as a necessary condition the giving of the girl a money equivalent for her practical, productive work.

7. Much remains yet to be done in developing the educational project as the central unit in the pedagogical organization of vocational education. We have made good beginnings in agricultural education; but in industrial, commercial, and homemaking education we have as yet not

even respectable beginnings. We sometimes think a practical "job" is a project; but it is no educational project, certainly, until its related technical knowledge and social insight have been woven or geared into it. We sometimes talk vainly about "projects" in technical knowledge alone. But this is pedagogic silliness and fad following. Technical knowledge by itself organizes very well into problems, experiments, exercises, and topics; but not into projects.

8. Liberal education and vocational education — how shall they co-exist and correlate? This is still a *pons asinorum* for all of those educators who cannot think in terms of the twentieth century. Shall we have vocational education in the high school? Yes, if the floors and grounds of the high school, primarily designed to serve the purposes of liberal education, can be adapted to give practical training to locomotive engineers, coal miners, street car motormen, sailors, printers, shoe machine operatives, traction engine drivers, poultry raisers, carpenters; no, if sincere and honest (no camouflaged) vocational education for these callings requires the provisions of realistic working conditions and genuine productive work.

When the learner, whether at fifteen, twenty, or twenty-five years of age, is ready to enter upon his vocation (or, equally, the vestibuled approach to it, provided by the vocational school) shall he give one hour daily to some dainty studies of that vocation, or shall he give to its pursuit an honest seven or eight hours daily? For the present we see neither sincerity nor effectiveness in the "blended" or "layer cake" programs of liberal and vocational education as it is often proposed to organize these within the working day. But, after the youth has begun his vocational education, shall we not provide for some continuance of his general or liberal education? Assuredly — but not within the hours devoted by the average man to his vocation. Let our boys in agricultural and

trade schools be encouraged and helped to extend their cultural interests in evenings and on holidays; let us thus early begin to form, in the hours appropriate to them, the avocational, social, and recreational interests, tastes, habits, and insights that we desire to see these people carry through life. Let us not do the silly thing of trying to use for this purpose the hours that nature and old social custom dictate shall be given to vocational pursuits.

On the other hand, as regards the eight or more years now required to be given by our youths exclusively to general or liberal education and the four or more years that are optional — let us see that this precious time is utilized to the utmost. We schoolmasters have many sins of omission or incompetency to answer for here, where our aims are so vague, our methods so unscientific, our results so unanalyzed and untested.

9. Many are the superstitions in education that we may expect to see blown up or dried up during the next twenty-five years. We shall certainly plumb the shallowness of the "cold storage" education which seeks to fill the mind with technical knowledge of a vocation before its practice is begun. We shall see the folly of confusing general or liberal education for children in rural communities with vocational agricultural education for those who are to be farmers. We shall learn to appreciate the almost criminal ignorance, the almost willful blindness, of those who deny or dispute the possibilities of definite vocational education for the highly specialized or so-dubbed "unskilled" occupations. We shall learn that good schools for the respective species of vocational education are not the rivals of good schools for liberal education, but their very desirable and necessary complements — that together they contribute to the rounded education, but that alone they give only a one-sided education.

VI

Courses and Curricula. — Our educational literature contains, as yet, only few and inadequate examples of what can properly be described as principles or programs of vocational education. For practical purposes we can distinguish in the successful practitioners of almost any calling, certain qualities that can be collectively designated as skills (manipulative or manual, mental, and managerial); certain other qualities that can be designated as technical knowledge; and certain other remoter qualities of ideal, morale, understanding of the social significance of work, and the like which can conveniently be designated as "social appreciations." But writers and curriculum makers rarely make vocational competency as a "total thing" the starting point of their work. They assume the continuance of conditions of apprenticeship learning or something analogous to that, after the completion of what is called vocational school education. Frequently vocational school teachers will say, almost boastingly, that it is not *their* province to *train* workers — engineers, machinists, salesgirls, etc., as the case may be; theirs is the responsibility only of instructing in "principles," in the "science," or the "art" of the vocation. This has long been the position defended by teachers of "applied science" in engineering and agricultural colleges, and of other technical subjects in schools supposedly educating for "business life," for the homemaking callings, for the "art-using" vocations, and even for "farming" and teaching.

The underlying assumption here, not always expressed in words, is that skills and other similar qualities essential to vocational success must be acquired in pursuit of the vocation itself. The school professes itself able to teach only the technical knowledge and a few forms implicated in technical skill (like drafting for engineering). Some of

the schools of this class now attempt to offer "social appreciation" studies related to the vocation — its hygienic, economic, and cultural aspects, to give breadth of view; but the efficacy of these offerings must still be a subject of doubt.

In the light of current developments of educational thought, however, it would seem indispensable that the entire body of theory heretofore underlying the formation of curricula for professional and other vocational schools be completely revised. These curricula seem almost universally to have been planned with chief reference to the limitations at the time known to exist in providing courses of instruction and means of teaching. The first question was not — what are the *total* requirements of the vocation for proficiency in the individual? but, how can a school be provided to teach the technical subjects supposedly needed in certain vocations? Hence the historic vocational school has sought only to be a complementary school — before or after practical experience obtained in the pursuit of the calling itself — and has not only remained indifferent to the prevailing requirements of the vocation, but has even sought incessantly to persuade itself that what it did not give in the way of training in skills, managerial powers, etc., was of little importance or was surely to be acquired in actual practice anyway.[1]

The results have never been satisfactory. Vocational schools have often been conducted by faculties of specialists who were not, and in many cases could not be, successful practitioners of the vocations in question. "Follow up"

[1] Certain exceptions should be noted: schools of nursing, because of the peculiar conditions attendant upon their foundation and development, seem usually to have made the total of vocational proficiency their direct aim; and schools of medicine and elementary school teaching seem latterly to have founded their programs on fairly adequate conceptions of the total requirements of the callings for which preparation was designed.

work has been most inadequate and rarely of a kind capable of actually affecting the schools' standards.

It is not, of course, to be expected that even the most perfect vocational school will give a *complete* vocational education in the sense of completely equipping the individual for the exercise of his calling at its full rate of compensation. This is not accomplished even in professional schools that are most fully developed. The by-education of participation is essential to give complete mastery. But that vocational schools can much more effectively and economically give certain portions of vocational education than can agencies organized for other purposes and offering instruction and training only as by-products, is now certain, as regards a large number of vocations. This has been abundantly demonstrated in the case of the professions and in some other callings; and it is intrinsically probable as regards all callings.

VII

Extent and Variety of Vocations. — How many "vocations" are now followed in the United States? No one can say with accuracy. Table I (page 515), abridged from the United States Census of 1910, gives at least these: agriculture, 30; Mining, 15; Manufacturing and Mechanical Pursuits, 200; Commerce (trade), 35; Commerce (Clerical), 10; Public Service, 17; Professions, 30; Domestic and Personal Service (excluding homemakers), 30.

But of course, many of the simple heads used by the Census — such as farmers, farm laborers, coal mine operatives, carpenters, electricians, silversmiths, machinists, shoe factory semi-skilled workers, clerks in stores, soldiers, teachers, and agents — are exceedingly composite. There is very little in common, as regards vocational qualifications, between the poultry grower in Massachusetts, the orange grower in California, and the "general farmer" of

Iowa. Coal miners, silversmiths, shoe factory operatives, teachers, and clerks in stores represent in each case many highly distinctive vocations.

The "Trade Specifications and Index of Professions and Trades in the (U.S.) Army" (1918) analyzed 565 distinctive callings, each requiring special qualifications.

Table II (page 531) shows how the United States Census classifies the 105,000 workers reported employed in automobile manufacturing; while Table III (page 532) shows a similar analysis of the specific occupations grouped under "Wholesale and Retail Trade."

It is a safe assumption that at least 2,000 important distinctive vocations are followed by the workers of America, and that for each, specific vocational education in schools may be desirable and is probably feasible.

CHAPTER II

THE SOCIAL NEED OF BETTER VOCATIONAL EDUCATION

Some Necessary Distinctions. — There are many definitions of education, hence there can be many possible definitions of vocational education. The best definitions can be made, as stated in the previous chapter, from observation of the social facts of vocation. All animals, including human beings, have to "earn their livings." The powers whereby animals do this seem largely instinctive, their instincts being often perfected by experience. Man also has a large variety of instincts that are basic to the skills and technical knowledge which he gradually builds up. But man, far more, apparently, than any other animal species, develops a "social inheritance" of useful arts and scientific knowledge, which each new generation must "learn."

The broadest definition of vocational education, therefore, covers *all* this learning of the social inheritance, as that takes place in the case of any individual acquiring powers of productive work. But in such learning at least three levels or stages can be distinguished. Children, youths, and even adults are so stimulated by their instincts of curiosity, imitation, and emulation that, up to a certain point, they will acquire skill and knowledge from others if only opportunities are available. Such acquisition is usually carried on in the play or amateur spirit. A second stage comes when, even in very primitive societies, the young or even adults as slaves, are forced to begin work, in the course of which vocational learning takes place as a by-product of such work.

A third stage is found when a period is set apart in the life of the individual for systematic education for his vocation.

In this book the words "vocational education" will usually designate only direct vocational education or education in vocational schools where the primary purpose is education and where production is only an incidental end. The first and second stages of vocational education noted above will usually be described as vocational by-education, that is, as by-product education, the actual skill, knowledge, and ideals acquired in any case being a by-product of play or of productive work.

No well-informed man will dispute the assertion that such vocational competency as is now found is usually the product of vocational by-education. Only for certain well-known professions and a few lesser vocations like stenography are well developed vocational schools yet available. When, therefore, we speak of social demands for "vocational education" we actually mean demands for more direct and purposive education to supplement or to replace the by-education now or heretofore found. If current social demands for improved vocational education are serious, it must be that the means and methods of vocational by-education, as developed through thousands of years of experience, are not sufficiently effective for modern life. Such ineffectiveness could be due to several causes. Possibly the historic forms have declined in efficacy. Such seems to have been the case with organized apprenticeship in the handicraft trades and some commercial callings. Perhaps the methods of by-education are ill-adapted to modern conditions in the vocations. Such seems clearly to be the case in the farming and home-making vocations. Perhaps vocational by-education is good, but too expensive of time and energy. Such seems to be the case in various pursuits involving delicate machinery. But back of all of these are certain large facts of economic demand.

I

The Effects of Progress. — One of the most conspicuous of all the results of social progress — under which we must include such factors as increase of population, rising standards of living, more extensive coöperation, growing interest in protection and increase of the well-being of the individual, mastery of natural resources, and the like — is the multiplication of the wants of the individual. Many of these wants, at first regarded as desires for luxuries, soon become in reality the needs of each individual who has become a member of social groups having civilized standards of living.

For people trying to maintain an " American standard " of living these wants to-day include factors of housing, clothing, education, recreation, and physical comfort of which our forefathers hardly dreamed, and which still are only remote aspirations to many peoples of the Orient and elsewhere in the world. It is sometimes urged by superficial talkers that " four hours' labor " would produce all that the average man " needs." Perhaps, if we sufficiently restrict the word " needs "; but it is humanly certain that the average man would, if he found that he could provide the necessities of life through four hours' labor — as possibly he could even now in places of ample resources in America — usually elect to work four additional hours in order to obtain thereby better housing, the diversions of travel, and the other " luxuries," that are sought eagerly by those with rising standards.

Individual Production. — It is axiomatic that in the long run each normal individual should produce or render at least as much service as he consumes.[1] Otherwise, a de-

[1] In economic literature, distinctions are made between the various processes involved in production whereby such processes as exchange and transportation are separated from actual first stages of production of raw materials or of elaboration of raw materials into finished products.

Throughout this work, however, the various processes of exchange

cline of social energies would ensue. But the capacity of the individual to produce goods, or to render service, varies greatly with age, training, social position, and accessible opportunity. We expect children, from birth (or before) to the age of six or more, to consume much service and to render none in return (economic service and goods are here meant, of course — namely the means of satisfying needs or desires for which, in common usage, we are accustomed to pay money or exchange service). From six to fourteen in those civilized states which make and enforce laws safeguarding the rights of children to education and to protection from injurious labor, young people render little economic service and consume much of it. Somewhere between fourteen and twenty-five according to economic status and vocational ambitions the average individual becomes a producer. At first he may produce only enough for his own needs, but soon, under normal conditions, he must produce a surplus over his own needs in order that he in turn may do his share in carrying his children over their period of non-productivity, as well as in providing for the non-productive aged, and other dependents. Finally, after a period of fruitful years, the productive capacity of the worker declines and he may spend the closing ten or twenty years of life as a non-producer, his demands being met from the

and transportation are included with production, simply as extensions of the productive processes. We can recognize that all production involves the necessity for some transfer and storage on the way to the destination of consumption, even when the consumer of a given article is himself its producer. When a given producer desires to exchange his product for the product of another producer, we have the elementary stages of transportation and exchange, all of which in the last analysis, must fairly be regarded as extensions of the process of production. The value of a commodity can most truly be estimated when it is ready for consumption, the intervening stages between actual source and the consumer having been passed. In the economic sense, therefore, all that is production which adds economic value to the article, until it finally reaches and becomes available for the consumer.

labor of others, or, under best conditions, from the returns received from the stored or accumulated results of his productive service which are being rented and used by others — interest on invested capital.

Universality of Vocational Education. — It is from the base line or sea-level of these fundamental considerations that we must survey questions of vocational education. Clearly, every person who renders productive service must have had some training to that end. That training, historically, has been good or bad, purposeful or haphazard. It has usually come as a by-product of voluntary or forced participation in productive work accompanied by incidental "showing" of points or "tricks" of the trade. Vocational training has, of course, been but one of the means consciously or unconsciously adopted by society to further the productive capacity of its members. The development of customs and standards of sustained and cumulative effort (labor, toil, drudgery, the "curse" imposed on Adam); explorations and inventions whereby nature is controlled to man's purposes; the establishment of ideals and means of storage of products of service for future use (thrift, property, savings, invested capital); the organization, specialization, and even regimentation of productive effort towards concert of action in certain forms of production — all of these must be included among the means whereby society endeavors to meet the demands, increasing in geometric ratio, of multiplying populations composed of members each with increasing wants. But, in the last analysis, the vocational training of the individual is the most vital simple requirement to be met, because such training alone lays effective foundations for other forms of productive effort contributed to society. With rare exceptions, only those persons best trained for their vocations contribute new inventions and discoveries; they only fit effectively into coöperative productive processes organized in complicated stages and sub-

divisions; and they only have a vital appreciation of the needs and possibilities of provident forethought under modern economic conditions.

The primary aims of vocational education being, then, to enhance directly the productive powers of the individual (the objects of liberal or general education being to improve his powers of utilization), it follows that the effectiveness of that education for any period and for any occupational field, whether as by-education or as direct education, must be determined primarily in terms of results as found in the total productive life of the individual — for convenience, let us say between fifteen and seventy years of age. For some callings, the net wage or income return may be accepted as a fairly satisfactory measure of the man's productivity, since that, in a social situation where forces of supply and demand operate normally, is the measure of the products of service, and service itself which other persons are disposed to give him for his service. We can thus measure the production of farmers, sailors, clerks, trade workers, servants, lesser business men, and "average" men in the professions. There are, of course, other callings in which this measure does not apply satisfactorily. The homemaker (as wife and mother) customarily receives no wage as such, while some of the most arduous service she renders (*e.g.* the care of sick children) can hardly be at all estimated in terms of economic value. Public opinion recognizes that no proportionate return in economic goods will probably be made to the poet, inventor, philosopher, scientist, explorer, soldier, or statesman for the services rendered by him. On the other hand, there exist sinecures (happily a diminishing number) in which, by virtue of some ancient custom or technical twist in the machinery of society, the incumbent, holding to his place like a true parasite, is able to exact from society more than a fair return for the service he renders. Hereditary places, emoluments and titles, and the "pro-

tected" positions in monopolized fields of service are examples no less than those of successful thieves, profiteers, gamblers, and "kept" wives and entertainers. It is also true, too, that for substantial periods the free play of competition in rendering service and in obtaining full return therefor may be arrested by the resistance of monopolistic groups so united in close coöperation as to be able to exact disproportionate returns. How far such monopoly prevails or is possible under given conditions is a matter for the experts to decide.

Nevertheless the social economist is safe in assuming that in general the prevailing rewards of service secured by any individual express with reasonable accuracy the willingness of others to exchange their service for his service notwithstanding the serious dislocations of effort and disturbances of means which occur from time to time in the normal operation of the laws of demand and supply. If we take account of the workers in America in their millions, — farmers, housewives, railway operatives, physicians, teachers, clerks, artisans, mill workers, soldiers, industrial managers, salesmen, — it is fair to assume that, under existing conditions of natural resources, utilization of scientific knowledge, economic organization, fostering legislation, immigration, customary working hours, mobility of labor, availability of capital, courage of "enterprisers," and scarcity of "creative" or original capacity, the average money return to workers in each class as well as, — with occasional exceptions, — that to each individual, represents an approximate measure of his productive capacity measured in terms of its exchangeability for the services of others.

Increase of Productive Power. — How far and in what direction is it desirable and practicable that such productive capacity be increased, among other means, by vocational education? The western nations everywhere and a portion of the Orient have accepted and now approve those

conceptions which hold a dynamic society to be desirable, and which approve of social evolution. We now accept the great social desirability of having social evolution — natural, or humanity assisted, — take the direction called progress, — that is, towards producing human life "more abundantly," in the broadest acceptance of that phrase. We recognize, and on the whole approve of rapidly increasing populations even though these involve an apparent overtaxing of the land to produce food, and especially live stock. It is generally held that many of the forms of individual well-being which we hold as socially valuable can be secured only through increase in the purchasing powers of the individual or of a group of individuals. We want for children more years devoted to education, that is, to preparation for effective adult life as that is made possible by further prolongation of developmental infancy and childhood; we also want for these children better living conditions as a means of growth, — food, shelter, facilities for play, wholesome companionship, travel, artistic surroundings, freedom from fear; and we want to guarantee them entry on productive work under favorable auspices. On behalf of adults we aspire to shorter hours of labor, richer opportunities for use of leisure, prolongation of active life, the maintenance of a strong family without excessive present strain or apprehension for the future, and the gradual storage of at least a moderate capital as productive investment. But the attainment of all of those desirable ends presupposes greater productive capacity in the individual either as a result of his own greater capacity personally, or of the development of more favorable conditions for the exercise of that capacity, such as discovery of more natural resources, new inventions, better leadership, more abundant capital, easier distribution of goods, and the like.

There is now much evidence that, through more effective specialized education, such individual productive powers

can be greatly increased. Here, as in the field of general education, it could readily be assumed on *a priori* grounds that so important a function as fitting the individual for optimum productive power should not always be left to the irregular and partial operation of processes of by-education. In the professions the processes of by-education, except in the latest stages of such education, have fallen into disuse and have been replaced by vocational school education. It is freely admitted that in all callings involving, for their successful exercise, a considerable amount of technical knowledge, — *e.g.* horticulture, electric installation, assaying, machinery testing, optical grinding, navigation, accounting, salesmanship in foreign countries, forest conservation — some direct special education is indispensable to success.

The movement for more effective vocational education in the United States, and in other civilized countries, — a movement which has manifested itself in the shape of widespread interest in the various questions involved, the formation of societies to promote study of the subject and tentative efforts for experimental and constructive work, — must be interpreted as representing one of the larger efforts of contemporary society to insure the wide promotion of human well-being under conditions of a steadily increasing population and which is in some directions, at least, pressing heavily upon the means of maintaining the standards of living which have come to seem desirable.

Vocational Education and the Individual. — The primary object of the state or of society in its collective capacity in promoting effective vocational education may be considered to be the safety of the state itself. Nevertheless, the security and effectiveness of the state can be achieved as one of its conditions only by means of individuals who are in themselves effective physically, vocationally, civically, and culturally. Furthermore, the function of the state, in the last

analysis, is the promotion of the well-being of the individuals composing it, and, under these circumstances, vocational education may be considered also from the standpoint of its possible contributions to individual well-being.

In promoting the well-being of individuals, it is a fundamental principle that state action or other corporate action should take place only when the competency of the individual himself or of those immediately responsible for him proves insufficient to guarantee an optimum of the conditions making for such well-being. By universal consent, the state, then, guarantees a protected childhood to every person born into society, this protection extending even to the point of removing the child from its parents or natural guardians in case their incompetency can be established. The ideal of a protected childhood is also realized through compulsory education, through prohibition of labor of young people except under stated conditions, and through guarantee of certain opportunities for growth and development such as playgrounds and freedom of movement.

It now becomes sound public policy also to include under the general designation of a protected childhood such a start towards economic independence as the state itself can insure in the event that the family and the individual himself prove unable to satisfy these needs. Elsewhere it has been shown that under modern conditions of industry, especially in large centers, the family and industry are proving more and more unable to insure either adequate vocational guidance or, more important, sufficient vocational training to constitute for given individuals a reasonably fair start in life.

II

The enhancement of the productive capacity of an individual by vocational education may first be considered in three relationships affecting himself alone: (a) His produc-

tive capacity under optimum economic conditions at any given period; (b) his productive capacity as a whole, that is, during the span of his working lifetime; and (c) his productive capacity as a net remainder after subtractions have been made on account of physical, cultural, and civic demands.

Intensive vs. Extensive Productivity. — For example, a given system of vocational training might result in a high productive capacity for a short time, but might fail to lay proper foundations for promotion or other vocational growth. It is believed by some that many forms of modern industrial employment lead to early enforced retirement — railroading is frequently used as an example. The primitive forms of farming, on the other hand, are supposed to admit of useful participation not only of children but also of very old men and women and even when these are not, by virtue of their ownership of capital, in managerial position. Available data on these matters are, however, inadequate and obscure. It would obviously be possible to train a person for what is an essentially juvenile vocation and to ignore the vocational needs to be met in adult life.

Or a system of vocational education might be mapped out which would take cognizance of a possible total working lifetime. It is well known, for example, that a large proportion of girls now follow a wage earning vocation for some years prior to marriage. A complete program of vocational education might include not only this wage-earning period as its objective, but also the subsequent twenty or thirty years of homemaking. There are those, indeed, who also foresee a period in the life of the strong woman when, after her children are grown, the routine of homemaking for two adults will not suffice to keep her powers adequately employed. For this period of her life also, she might well have the needed guidance, training, and opportunity to render such economic service as she can.

It is probable that certain complex social problems of labor adjustment are involved in the ideal of so organizing vocational education as to insure a long life of productive activity. As traditions go at present, the man somewhat past middle age who cannot " keep the pace " set by younger men or by himself when younger, is apt to consider his usefulness at an end (or the employer does so, with the same result) and to give up his job, possibly to relapse into complete idleness. Ideally, of course, society should offer to each, in quantity and quality, opportunities for the work that he can best perform. It seems to be a fact that in primitive stages of industry the aged or impaired man still had opportunities for work which are largely denied him in more advanced stages of economic evolution. Whether labor conditions can be so readjusted in the future that the man of declining powers will still find and willingly accept a place of usefulness is one of the unsolved problems of contemporary social economy.

Non-Vocational Needs.— Vocational powers must also be considered with reference to the other obligations and opportunities of the individual. A vocation in which a man might be highly productive over a long series of years but which denied him opportunities for family life or discharge of civic obligations would necessarily be heavily discounted by these disadvantages. There are callings in which health risks are great, especially for individuals predisposed to specifiable forms of weakness. Here again the claims of the vocation as a field of productive opportunity are not the only claims to be considered. Many juvenile occupations in factories, for which relatively high wages are often paid by virtue of the restricted or specialized character of the activities involved and possibly by the speed required, seem to entail heavy handicaps on physical development. The advantages of these, therefore, from a wise social standpoint will be heavily offset by the health liabilities included.

It is possible that America may in the future require what has long been the case in Europe, namely that each male citizen shall be required to devote a portion of his time to the defensive service of his country. Under these conditions, preparation for, and participation in, vocation will measurably have to give way to required military training which can be regarded as a secondary vocation. Similar conditions of less obvious nature are involved in the possible connections between vocation and the man's civic or cultural life. A vocation such as teaching may, for a given individual, involve cultural opportunities not to be found in mining or farming. The man qualified to profit culturally from an urban environment may very properly refuse to enter a vocation necessitating rural residence, and vice versa.

III

Essential Factors in Productivity. — The potential power of an individual to produce economic goods will always be greatly affected by conditions largely beyond his control, of which the following are the most important: *a.* The natural or other resources available (fertile land for the farmer, ores for the miner, timber for the woodworker, fibers for the textile worker, interested audiences for the singer, seekers after superior medical skill for the physician, husbands and their incomes for the homemaker, etc.);

b. Social inheritances of vocational knowledge and method (inventions, customs, arts, technical knowledge of process, etc.);

c. Capital, fixed or mobile, such as is represented by: cleared land, buildings, discovered mines, timber made accessible by roads, transportation facilities, etc., for farmers and miners; buildings, engines, tools, and revolving funds to keep up food supply and wages while goods are in process of production and delivery to final markets, etc., for indus-

trial workers; house, furniture, reserve money, etc., for the homemaker; and offices, stocks, and storerooms for commercial workers;

d. Social organization of demands for products — or markets — involving, of course, extent and character of opportunities for procuring useful exchangeable goods in return for products;

e. The inherited bodily powers and capacities of the individual;

f. The acquired powers and capacities of the individual, — health, civic, cultural — which, while not valued chiefly as affecting vocational competency, nevertheless have important bearings on it.

1. **Basic Essentials.** — Obviously no man can farm on rock, mine gold or coal where none exists, build modern houses or ships when there can be had no timber. A teacher or preacher can get no productive return for his services where learners or listeners are not available. "The voice of one crying in the wilderness" does not command wages. Manufacturing industries, no matter how skillful the workers, can produce nothing without a supply of raw materials. Homemaking as defined in this book obviously requires for its practice a place of residence, a husband, children, etc., as necessary working materials.

It is important to note that the part played by raw materials or natural resources in production is affected heavily by what may here be called "pressure of population." When population is sparse, the relative value of raw resources may be made to yield the maximum possible return.

2. **The Social Inheritance.** — In a very true sense production in modern society is almost completely dependent upon the social inheritance of inventions given by our progenitors. The arts of metal working, fabric making, tillage, defense, communication by symbol, preaching, and

teaching represent but a part of this inheritance. Of practical importance is the fact that in the processes of social competition of peoples, regions, and nations, no less than individuals, the race will in large measure be to those who best use and improve upon the social inheritance, whether that be through a new variety of potato, a better explosive, an improved process of tanning, the invention of a new synthetic dye, a better system of filing, the more thorough exclusion of flies from the home, or a better balanced rationing of an army. Technical knowledge and implements play a part in modern production, the importance of which is frequently overlooked by the easy theorizers as to "collective" action. These instrumentalities, as a matter of fact, are largely responsible for the increasing part played by capital and organization in modern production. The actual responsibility of given individuals, even those in directing positions, for the improvement of old, and the discovery of new means of production, is probably smaller than is commonly assumed and is now diminishing. It is the collective "mind" of the larger groups and perhaps in increasing measure the collective mind of the state itself, which must ultimately assume largest responsibility for the progressive use of the social inheritance of the tools and knowledge involved in productive work.

At any given time a comparison of the methods of retarded peoples, corporations, or individuals as regards their uses of economic social inheritance is both illuminating and suggestive. In all communities that are "advancing" by prevailing economic standards it will be found that "business" — as the term may be used to denote the aspirations, ideals, appreciations, customs, and knowledge of the thinkers, planners, and leaders — becomes, obviously, intensely conscious of the importance of improving on historic means and methods. Research and invention are stimulated by protection, reward, and subsidy. In recent years the state has

participated largely in these processes. Government agencies have been responsible for a very large part of the development achieved during the last half century in American agriculture.

Systematized vocational education becomes one of the most effective means for transmitting the newly developed knowledge. The methods of apprenticeship fail here conspicuously. On the other hand invention may, and often does, produce the "fool proof" machine which becomes an effective tool in the hands of even a poorly trained user. Good watches, machine guns, stationary steam engines, shovels, concrete houses, or automatic stop looms will often render excellent service in the hands of illiterate and untrained workers, although these tools themselves represent the culmination of ages of invention in their evolution and of endlessly varied skills and technical knowledges in their fabrication. The possible secondary social consequences of the inventive processes which give us these perfect tools are not calculable as yet.

3. **Capital in Production.** — The part played by capital in production is usually clear to the business man and to the economist, but not at all to hired manual laborers, or, it would often seem, to legislators. The education designed to diffuse such knowledge is, ordinarily, more properly civic than vocational; but for a person preparing definitely for a known vocation it is highly desirable that his vocational education should include instruction in the part played by capital in the organized productive processes of which he is to be a part. It would appear, for example, that successful agriculture in the United States requires increasing outlays of capital in proportion to labor. Unless this tendency is modified by the development of state or corporate owned instrumentalities, extreme care will have to be exercised in the selection of those to be encouraged to pursue agricultural training towards the "farm owning" vocations in order

that possession of natural gifts of managerial ability be assured. Not many men are gifted by nature with the basic qualities required by current standards of security and planning to be managers of large enterprises, and especially those involving much of that easily impaired commodity named "capital."

In manufacturing, transportation, and commercial fields of productive enterprise the relationship between capital and profits is often obscure to workers. Indeed it is not, in the case of a given enterprise, always clear to anyone, since the "dividend takers" or stockholders are often investors of capital rather than personal abilities, hence their "profits" may often be in reality more "interest" than "profit" as ordinarily conceived — that is, the enterpriser's reward for his knowledge, daring, foresight, and organizing ability. There prevail to-day widespread beliefs that "profit-takers" are, as a class, generally so situated that they can exploit laborers and, probably, investors, too. It is easily seen how the rewards of labor are largely controlled by the operation of the law of supply and demand; and the rewards of capital invested for a guaranteed return (interest on bonds, mortgages, dividends on preferred stock), it is now generally recognized, are also governed in the same way. But much doubt exists still as to whether the rewards of those who have no guaranteed returns as wages or interest — non-salaried entrepreneurs, investors for common stock dividends — are governed by the same laws of supply and demand. Probably all distributions of shares of product under ordinarily prevalent conditions are controlled far more largely by the basic law of demand and supply than by all other factors — custom, monopoly, ignorance, legislation, and the like — together; but until better means than are yet available are found to make this clear to consumers and various camps of producers, we may expect a continuance of the suspicions, antagonisms, and wars that are at present

distracting and demoralizing production. "Related social education" as part of vocational education should, of course, prove increasingly adequate to clear up the situation to various kinds of workers in a given field and enable them to forestall or correct pathological situations of monopoly, exploiteering, etc. But society will probably long be tempted, in some of its divisions, by the "Rhine Gold" of the stored capital essential to modernized production; and just as primitive men could see little use in October of storing large quantities of nuts, seeds, and dried meats against December and January, and often preferred to "feast" at once, so whole groups of people will probably long continue to see in stored capital promising means of present enjoyment if only the legal claimants thereto can be dispossessed. It will require a very well developed system of civic or economic education to produce effective "social wisdom" here.

4. **Social Organization.** — Given raw resources, a large social inheritance of inventions and technical knowledge, and abundance of capital, productive processes are nevertheless without effect unless there be present various forms of *social organization.* Of these government and laws to define and guarantee security and order may be considered of first importance. Next is regimentation (in no invidious sense) or that coördination of workers by which each takes or receives the part in the total process which he can best perform. Last is commerce with its subphases of transportation, storing, and marketing, with endless specializations in banking, credit, inspection, standards, and the like.

Very probably modern production in manufacture, mining, lumbering, fishing, and some forms of agriculture would be wholly impossible on present scales except for the very elaborate organizations that have accompanied its evolution. The corporation, as a means of providing for concentration of capital and regimentation of workers from the most to

the least talented, controls to-day in nearly all transportation, distance communication, manufacture, and mining. Every industrial state has found it necessary to produce an elaborate body of legislation as well as various agencies of enforcement in order to protect productive enterprises on the one hand, or their special workers and investors or the public on the other. Territorial specialization of production has been a marked consequence even where natural localization of raw resources has not dictated it.

The complexities thus added to the social structure of modern societies are still largely beyond the capacities of any one man adequately to appreciate. Modern government finds the largest single department of its activity in economic legislation. The specialization of producers into investors, employers, and employees gives rise to class consciousness, class organization, and insistent contests for special privileges in sharing products.

It is very doubtful whether contemporary means of either civic or vocational education are at all sufficient as yet to give even a forceful minority of prospective citizens appreciations, to say nothing of comprehensions, of the vital part played by social organization in the economic production which enables the multiplying wants of dense populations with rising standards of living to be even partially satisfied. Here, as in the case of the place of capital in production, there is every reason why the vocational schools should play a large part in serving both its students and also society.

5. **Individual Inheritance.** — The ability of a given individual to produce is in fundamental measure dependent on the factors, largely outside himself, discussed above; but in another sense it is no less dependent upon inherited and acquired qualities within himself. A man cannot use the tools or the knowledge given by the social inheritance on the materials provided by nature unless he possess the muscular powers, senses, and organs of intellect characteristic of normal human beings.

In fact it is now certain that among men great variations prevail in the amount and quality of the various forms of "original nature" inherited. A man naturally small of body is thereby disqualified for many types of heavy work. History as well as science seem to show that, generally speaking, women cannot do the same kinds and qualities of work as men. Probably the reverse also is often true. A few men seem born with extraordinary endowments of mathematical or musical or exploratory or combative powers. Very likely some men are born with extraordinary potential powers of leadership, business organization, mechanical invention, or artistic ability. The warm advocates of vocational guidance may have raised unwarranted expectations as to the needs and possibilities of "fitting square pegs to square holes," but, nevertheless, every observant worker with adolescents becomes increasingly convinced of the fact that, as the world of work is now organized, there is an "optimum" job for every individual, and that it is of signal importance to that individual and of substantial importance to society that he be helped to the discovery of his life work (or successive stages in life work) as near this optimum as practicable.

The operation of the "selective service" agencies created to meet necessities imposed by the war has revealed unsuspected possibilities of allocating, even through simple psychological tests, youths or adults to the forms of study or productive service best suited to them. At this writing it would be premature to summarize the possibilities thus revealed; but it is certain that every supervisor, director, and teacher in vocational schools will hereafter find it of the utmost importance to ascertain, on the one hand, what are the optimum requirements (always judged by sane and practical standards) of the vocations open to those whom they seek to train, and on the other the native qualification possessed by those seeking entry to these vocations.

It is a fair assumption that the modern specialization of industry and the increasing use of automatic and "fool proof" power driven machines serves greatly to extend the range of occupational pursuits in which persons of mediocre or inferior or even abnormal native powers may become productive. When men lived chiefly by hunting it is probable that many of the poorly endowed starved to death. But modern tools and organization can be made greatly to help those of good native gifts. Quite probably modern society, and especially the state (which is a clumsy and backward directing body as yet) has not sufficiently lived up to its responsibilities of helping those of inferior powers to get into their optimum work. That is a problem of which social economists are just now becoming keenly appreciative.

6. **Acquired Powers.** — Finally the productive power of a given individual is very dependent upon his acquired powers. These may be considered under two heads — the powers generally serviceable in life generally, as well, perhaps, as in the vocational activities of life, and those primarily serviceable in vocation. Obviously the physical, linguistic, artistic, literary, scientific, and moral powers and capacities which schools of general education seek to find, improve, or create have some functional value in vocation as well as in the other activities of life. On the other hand success in a particular vocation always depends upon the possession by the individual of a variety of special skills, ideals, and forms of knowledge which possess little significance to him apart from his vocation.

Of non-vocational powers and capacities it is impracticable as yet to evaluate the importance in modern productive processes. Probably it is futile to attempt to generalize; only by studying the requirements of particular fields of work in connection with particular qualities can we hope to reach useful conclusions. The whole subject has been

greatly befogged by the attempts of men of strong academic prepossessions to state "optimum" standards.

Looking at workers about us it is clear that in some vocations the ability to speak English is indispensable; in others it is merely a convenience. One cannot imagine an illiterate man becoming a successful physician, lawyer, or editor; but in many other vocational fields the proportion of successful men among illiterates is hardly smaller than that among literate men, due allowance being made for forces of selection. For success in many vocations certain conditions of health are desirable or necessary; but it is not in evidence to what extent "health" is or can be made a product of by-education or direct education, and how far it is due to inherited conditions. There are many vocations that are open only to persons of established reputation for approved moral behavior. The bases of the moral character thus required may be due to general school or non-school education; or they may, like health, derive in large part from qualities of "original nature" that can be discovered but not made.

For the present it is sound policy to require that the vocational school or other specialized agency of vocational education take upon itself the burden of proof in sustaining the minimum standards of inherited or acquired general fitness which it imposes at the outset. It can safely be assumed that the men of academic prepossessions who will long be in control of the machinery of vocational education will tend to impose unnecessarily exacting standards. This cautionary attitude has nothing to do, be it understood, with the provision of desirable standards of general education to be met either before entry upon vocational pursuits or in direct preparation for such entry. Right minimum standards of cultural and civic education should be established quite independently of vocation, as a rule. It is not improbable that the high minimum cultural standards long imposed by vocational schools of theology, law, medicine, military leader-

ship, and other vocations involving so-called leadership have actually been vocational, or at least vocationally selective, in their final analysis and operation. If not, they have probably been unwarrantably and factitiously artificial and undesirable.

IV

To the educator and to the social economist of the future must be left many as yet partially unsolved problems which intimately affect the extent and character of the vocational education required for given vocations. Among these problems are the following: (a) Should "industry" be expected to provide for its own vocational training? (b) What are the necessary results of specialization? (c) Are the "trades" declining? (d) Would vocational schools "overcrowd" certain callings? (e) Should men be educated to be "employees"? (f) What will be the effects of increasing "state control" of production? (g) Is vocational education democratic? (h) Should vocational education be compulsory? (i) How far should society control conditions of entrance upon wage-earning? In the analyses below the writer's present opinion is frequently indicated, usually as a spur to further analysis and study.

1. **Private Vocational Education.** — It is sometimes asserted that "industry" should provide at its own expense for vocational education. This expectation is usually based upon two misconceptions. If a given employer (it may be assumed that at the outset every worker starts as an employee) could be sure of retaining permanently the services of those whom he might train, then countless employers would undoubtedly devote no less attention to training workers than to providing suitable material equipment. But such is not the case. The very great mobility of modern labor renders it impossible for the average employer to devote time and energy to the training of novices. Again, it

is naïvely taken for granted by persons who have not studied the matter, that in a given field of production, — *e.g.* gardening, banking, housebuilding, transportation, — there is an important *collective* interest and, therefore, *collective* will and purpose which should be enlisted to promote private vocational schools in these fields. But this ignores the acute and persistent competition which normally exists between each unit and every other unit in the same field, — a competition which only gives way slowly before efforts looking to consolidation and combination, which efforts, because they commonly foreshadow monopoly, are viewed by society with suspicion and are even outlawed. It is conceivable that in a new kind of economic order, all the housebuilders of a city or state would be combined, as are now, commonly, telephone operators and street car operators, and that they could collectively undertake the vocational schooling of young workers. But for the present, we have to assume that in general the mobility of labor and the competing interests of employers will long preclude the development, under the direction of industry, of good vocational schools. Exceptions will be found in those industries which have practically suppressed, or at least regulated, competition or have learned to coöperate broadly in certain essential respects, — telephone, street car transportation, a few lines of manufacturing like printing, etc.

2. **Specialization.** — It is important that the causes and effects of specialization, especially in production and exchange, should be examined by students of economics from the standpoint of possible effects on vocational education. In the absence of other evidence, we are justified in assuming that specialization of productive effort is an economic necessity, that it is one of the most effective means of increasing the productivity of the individual worker through his greater use of machinery, development of more skill and concentration on a particular enterprise. In almost no

respects does one to-day detect retrograde tendencies in economic specialization. Every enlargement in units of production, every tendency towards territorial specialization of agriculture, and every advance in the use of technical appliances seem to be accompanied by increasing subdivision of processes and specialization of the worker. Considering the increasing economic productiveness of the worker under these conditions, it is doubtful if any class of producers would be willing to exchange rewards as they exist under specialization for those which they supplanted, regard being had to growing pressure of population, scarcities of raw materials, and rising standards of living. But specialization is frequently accompanied by what may be described as socially pathological manifestations. Under some conditions, the specialized worker may be described as the " slave of the machine " although probably, in some cases, he could more correctly be described as the " master " or at least the " tender of the machine." In many instances extreme specialization has made the employment of large quantities of comparatively unskilled labor a simple matter. But probably, in an equal number of instances, at least, the specialization of the worker and his employment in expensive processes has raised the qualities of skill, sobriety, and general intelligence demanded of him — for example, the chauffeur, locomotive driver, ship captain, farmer using a power driven apparatus, furnace man, elevator man in large buildings, or drill press operative, etc. For the present, in the absence of evidence to the contrary, we can well assume that with rising standards of living and increasing disposition to demand a wide range of consumable goods, individual producers can achieve their desired ends only by increasing their production through specialized efforts.

It is furthermore highly probable that every tendency towards specialized work will produce pathological conditions

against which enlarged ideals of social economy will insist on the application of corrective measures, perhaps as forms of social sanitation. For example, it may be found that highly specialized mechanical operations pursued eight hours a day will, in the main, not affect injuriously persons who have already attained to maturity of body and nervous system, whereas such eight hour a day work on highly specialized operations might affect very injuriously comparatively young people whose bodies are undeveloped and whose nervous systems are still very plastic.

Again, under some circumstances, machine operations may be so conducted that the speed of the worker is determined by the speed of the machine, over which he has little or no control, and that under these conditions, disastrous results may be produced even on the adult organism. In the light of contemporary knowledge it seems highly probable that for operations of this kind, one essential is that specialized workers shall be given examinations in order that those most qualified for such mechanical manipulation may be selected. Furthermore the speeding up of machinery over which the operator has no control may have to be regulated by law or inspection.

There are also possibilities that individual workers should be trained to pass, even within the course of one day, from one type of machine to another in order to have a change of occupation and strain. It is entirely possible that large gains would result from transferring, for a part of the day, a specialized operative in a very noisy textile manufacturing room to some other type of similarly specialized work offering materially different conditions.

As regards noise and other operating strains, no amount of argument against specialized work achieves any useful purpose unless it takes account of the increased productivity made possible by such specialization and the relation of that to the higher standards of living demanded by workers.

Whether it is sufficient to trust to the law of supply and demand of labor as a means of adjustment of workers' share in specialized production achieved largely through capital invested and managerial intelligence, as well as labor, is a question that can hardly be discussed here. If, under any given circumstances, a process of specialization of labor does not give to the individual worker any share in the increased production thereby made possible, it may be that special social adjustments should be made. This is a question for the economist and is, of course, particularly tied up with such difficult questions as the minimum wage, artificial interference with laws of supply and demand as regulating compensation of labor, etc.

3. **The Place of the Trades.** — At the present time many programs of so-called industrial training in cities of the United States are in reality more or less complete programs of training for the trades. The word "trade" as applied in industry has various significations, but in the main its connotations are based upon ideals and practices derived from the time when trades were, in the full sense of the word, handicrafts — that is, hand trades.

It is well known, of course, that the progressive development of machine production has resulted in a steady decline of handicraft trades. This has been especially true in fields where production on a large scale is possible. One does not commonly associate the idea of trade worker with the operations involved in the production of such staples as cloth, automobiles, glass and pottery, electrical appliances, furniture, paper boxes, books, newspapers, ready-made clothing, packed meats, packed fruits and vegetables, flour, sugar, locomotives, rails, crude copper, coal, pig-iron, lumber, shoes, building materials, etc. It is true that some divisions within these fields of production wherein a considerable amount of skill is involved, have come of recent years to be called trades, even though the operation is highly specialized, and

in many cases, the participation of the worker is essentially that of machine tender.

Recent years have witnessed the gradual decline of such trades as those of cabinet maker, baker, shoemaker, wheelwright, potter, etc., while others, such as tailor, dressmaker, etc., are in process of decline. Great changes are undoubtedly also taking place in the structure and organization of such trades as machinist, plumber, bricklayer, carpenter, printer, and glazier, while, of course, pending changes in industrial processes develop new trades such as those associated with the installation and maintenance of electrical apparatus, steamfitting, and the like.

It is of the utmost importance in the interests of sound thinking about vocational education that we shall not confine ourselves exclusively to the terms and conditions of the handicraft trades. Modern production is specialized and there is every prospect that it will become much more specialized. Standardization of materials for building and even the standardization of buildings themselves, may be a matter of the near future.

It is not improbable, of course, that where, in the process of production, much subdivision has occurred, an individual worker should be trained to cover more than one subdivision, partly as a means of enabling him to shift his services in time of necessity, partly to give him a wider range of work as a means of conserving health, and conceivably also, as a means of enabling him better to understand the sequences of productive processes involved in his field of productive enterprise.

4. **Overcrowding of Callings.** — One of the earliest questions encountered in establishing vocational schools is the danger of overcrowding certain callings. Nowhere, so far as the writer is aware, is there any adequate discussion of the conditions involved in what are known as "overcrowded callings." Overcrowding must be conceived in reference

to some relative or absolute standards, and it may be doubted whether, in the absence of these standards, we are justified in calling any one calling more overcrowded than another.

Certainly it would be folly to speak of the medical profession or the teaching profession or farming as overcrowded. Relative overcrowding may be conceived in terms of an established or desired rate of compensation. For example, domestic service is not now overcrowded as evidenced by advertisements in newspapers, if the historic rate of compensation is taken as a basis. On the other hand, if we were to pay domestic servants at the same rate that we pay trained nurses, it may be questioned whether we should not find the calling immediately overcrowded. Newspaper advertisements seem to indicate a perennial scarcity of sixteen to twenty year old girls in department stores and factories. Are we to assume no overcrowding here?

Where attractive rates of compensation have historically existed, there is a tendency for persons to enter the calling and competitively to bid against each other for the higher compensation, thus giving every appearance of an overcrowded field. Would we be justified in saying that the field of unskilled labor is, for example, more overcrowded than that of skilled printers, machinists, bookkeepers, small merchants, lawyers, college teachers, etc.?

Where a calling may demand considerable amount and variety of personal qualities as well as certain forms of technical skill, the advertising of an opening frequently attracts persons who possess only in part the qualities desired, but who, nevertheless, hope to find themselves the best among the offering. There is thus given a specious appearance of overcrowding in the calling in question. This is noted conspicuously when vacancies in public school positions, in various departments of the civil service, and in managerial positions, are open.

5. **Employer vs. Employee.** — Almost every man in the highly civilized modern state stands in some capacity as an employee in society and in some other capacity as an employer. In all forms of corporate organization of business, stockholders may be looked upon as the final employers, while directors are their selected representatives and responsible to them in very much the same sense that actual employees are responsible to their immediate employers. Under the directors in any corporation every person is an employee, but in many cases these also have employers' responsibilities towards other subordinates.

Persons who are employed in a corporation have organizations or unions each having their own employed delegates; thus the employee becomes an employer in turn. It would be exceptional to find to-day in any case of transportation or production through corporations an individual who is not at some time and place an employee and, at some other time and place, an employer, with all of the responsibilities that these relations imply.

In a very real sense every citizen is the employer of "public servants" from president and governors down to teachers and policemen.

Outside of agriculture, homemaking, small shopkeeping, the professions, and a few trades, relatively few adults are ever "independent" workers; while in nearly all fields of work, young workers first undertake productive service distinctively as wage-earners. These facts must necessarily greatly affect vocational education for young workers. Ought we to think of young men even in agriculture as probably destined to "independent" work before twenty-five?

6. **State Control.** — Study of contemporary tendencies exhibits a great variety of developments of state control looking towards the more satisfactory relation of the employee to his work and its returns. Much legislation already exists defining the age at which young workers shall

be employed on so-called "dangerous" machinery or in "dangerous" trades. A very great variety of legislation defining appliances to be used on railways, protective devices in factories, regulations for the use of so-called "dangerous" chemicals, etc., now exists. Employers' liability laws persistently operate in the direction of regulating, in the light of scientific knowledge, conditions under which workers may operate machines, undergo risks, etc.

We also see now extended state control of rates that can be charged by public service corporations, of the extent to which corporations will be permitted to organize in the form of trusts, of the sale of speculative securities, and in addition, of publicity of accounts. In all of these directions we may count upon a steadily increased tendency towards that form of regulation which experience will demonstrate to provide for the maximum of common welfare.

Besides these it is manifest that state ownership or direction of productive enterprises is increasing. The major parts of education, road maintenance, fire protection, lighthouse maintenance, public service inspection, water supply, waste disposal, mail and package carrying, and dock provision are now municipal, state, or national enterprises. Probably these tendencies will, when understood, greatly affect the needs of, and procedures to secure, vocational education.

7. **Is Vocational Education Undemocratic?** — Educators, business men, and social economists, who during the last decade have been supporting the movement for more efficient vocational education than that which is now provided incidentally and intermittently by farm, home, shop, and office, have encountered various forms of opposition. Because they sought the creation of efficient schools for the training of farmers, trades workers, homemakers, and clerical specialists, they have been charged with seeking to destroy the regular public schools. Because they urged that, for young people past the age of compulsory school at-

tendance, opportunities should be made available for definite and practical training in the technique of trades and other callings, differentiated as these are in the world of practical affairs, they were charged with being interested only in "narrow" education — in the "teaching of mere skill." Because they recognized and held that the training which makes a young man a good tailor is essentially different in all details from the training which makes his brother a good carpenter, they were charged with supporting proposals for "undemocratic" education.

Now the issues of vocational education are far too important to permit of their being damned by the vague word "undemocratic." We want nothing more incorporated into American education, public or private, that is contrary to the sound principles of democracy — we have too much of that. If the plans now before the peoples of many states — notably, Massachusetts, New York, New Jersey, Indiana, Wisconsin, Pennsylvania, and Connecticut — for the improvement of systems of vocational education already established with state approval, and under state control and support, are in any respect undemocratic, it is in the highest degree essential that early proof of that fact should be given. Progressive states, east and west, north and south, are, in the persons of their most far-sighted citizens, now planning for state systems of vocational schools. The national government provides financial aid and coöperative supervision for at least three types of vocational education — namely, industrial, agricultural, and homemaking — and will doubtless aid basic commercial education in the near future.

What then are the specific characteristics of the vocational education here under consideration, as judged by the legislation already enacted, and administrative plans already promulgated in the states that have got past the stage of discussing? An understanding of these facts is essential to a determination of the possible validity of the charges made

relative to the supposedly undemocratic character of vocational education.

First, wherever vocational schools have been established, admission to them is conditioned on completion of the requirements of compulsory school attendance. As a rule these requirements include both an age qualification, and also a scholarship qualification — usually at least the completion of the fifth grade. In other words, no youth may enter a vocational school until he has reached the point where he is equally free to enter the shop or office as a full-time worker, or to spend his (or her) days exclusively at farm or home work. To the charge sometimes made that the specialized vocational school is "narrowing" it is a fair retort to question whether it is more "narrowing" than the place in the department store, the specialty in the factory, or the daily routine of office, farm, or home. For these are certainly the prevailing alternatives. In every industrial community, we know that at least half and often many more than half of all the children leave school forever within six months after completion of the requirements of compulsory attendance.

In the second place, the vocational school has found specialization a necessary means of efficiency. Even common sense will satisfy us that the special training required to make a proficient machinist will differ in all significant respects from that required to make a house-painter. Are there any fundamental elements of vocational training common to stenography and carpentry? Practical electricity and tailoring? Farming and stone-masonry? Teaming and bookkeeping? Homemaking and printing? Persons who have not clearly defined for themselves the special character of vocational education will, in their confusion, contend that certain elements are common among people who successfully follow these vocations, such as elements of health, physique, character, general intelligence, mental acumen, and social ideals.

The reply, of course, is that in so far as these qualities are not differentiated and specialized according to the vocations being followed, they are the legitimate objectives, not of vocational schools at all, but of schools of general or liberal education. In any northern state, the public school has had at least eight years of the child's life in which to lay the foundations of culture, citizenship, character, and general intelligence. For our industrial and commercial workers, this is now more commonly ten or even twelve rather than eight years, a larger amount of time on the whole than is given in any other country in the world. It is not certain that our public schools now make very effective use of this time, and it is not in evidence that systematic, specialized vocational training will make no important contributions, as a by-product, to these general qualities.

During the last decade a great change has taken place in the attitude of Americans towards vocational education; by which we now mean any specific education designed to prepare a person for the effective pursuit of some calling. Formerly, it was seriously questioned whether publicly supported and controlled schools should undertake training for industrial, agricultural, and homemaking callings. This attitude persisted, notwithstanding that in western state universities the professions were being taught, that even the national government was giving financial aid to higher forms of agricultural education, and that cities had extensively developed commercial departments in high schools.

But it is hard to-day to find an intelligent man who does not believe that, for large numbers of our young people, some form of systematic and direct occupational training is essential — essential from the standpoint of the welfare of the individual, as well as from the standpoint of the community and the state.

This thesis is here submitted: That education as it has been organized heretofore in the United States, while not

so undemocratic as that of countries where, by means of the varying fees charged for tuition, children are practically segregated along caste lines, has been much less democratic than it will be when a properly organized system of vocational schools shall have been created to add opportunities for occupational training to those now existing for general education.

What is the essence of democracy? Does it not consist in removing as far as practicable all artificial barriers (birth, rank, wealth) to the enjoyment of equal opportunities; and mitigating, as far as society can safely do so, the inequalities created by natural conditions?

Now it is fair to characterize as undemocratic a system of schools like that of Prussia, where, for example, at least three different classes of school are open to a boy of thirteen years of age of good ability; namely, a school in which only a nominal charge is made for tuition, another in which a fee of perhaps eighty marks is charged, and a third charging upward of one hundred and eighty marks. Inevitably sons of poor people can go only to the first, whilst the last will in effect be reserved for the sons of the prosperous and prominent.

American high schools are not undemocratic in that sense; they are tuition free, and equally accessible to the son of the washerwoman and the son of the millionaire. But there does exist a condition in America to-day which is essentially undemocratic. Contrast the opportunities now open to the son of the wage-earner who has four or five children in his family with those available for another boy of equal ability whose father has an income of $5000 per year. In the first case, the boy from necessity and from honorable desire, too, not excessively to burden his father, must become a self-supporting worker at not later than sixteen years of age. The second boy can postpone self-support until twenty-two or even twenty-five or twenty-eight.

But what school opportunities are open to the first boy on completing the eight grades of the elementary school? He can perhaps attend a high school for two years, in which, theoretically, he will be continuing his general or liberal education, but in which, practically, he will be given only the husks of introductory algebra, a foreign language, ancient history, and very formal English. Practically nowhere can he find opportunity to obtain definite equipment for some field of productive work. He must enter upon employment as an unskilled laborer, one of a horde of the "hired to-day, fired to-morrow" kind. Every step in his advance towards the occupational competency of manhood is beset by vicissitudes and oppressive conditions. In some cities, he finds evening schools to help; in most places, none.

The other boy, less hurried, prolongs his general education to eighteen, possibly to twenty-two years of age. Or, eager to get at work after two years of general high school work, he finds commercial departments of high schools opening opportunities for at least a partial vocational training to him. If he finishes the high school, he finds scores of openings for vocational education before him, state schools of agriculture, engineering or teacher training, endowed schools, often with scholarships, for theology, medicine, law, and other professions. His road to vocational competency is beset by no such difficulties, exposed to no such hazards, as that of his fellow.

But these undemocratic inequalities are largely created by society; they are not due to natural causes which the state cannot correct. It is the state which says in effect: "To them that have shall be given, and from them that have not shall be taken away even that which they have."

The hardships wrought by this situation on individuals are apparent, but it is none the less true that society in its collective capacity suffers also; state and nation are not what they should be when a large per cent of their members reach

mature life unfitted for first-class productive work, discontented and vagrant, ready, often, to turn their anger against the state itself.

What, now, are the essentially democratic characteristics of current proposals for vocational education, as exemplified in the legislation of at least half a dozen of the more progressive states? First, the state continues, just as heretofore, to exact on the part of each youth a minimum period of school attendance in a school of general education — closing in no case before the completion of the fourteenth year; similarly, it exacts as heretofore a minimum standard of scholarship — usually at least the equivalent of the fifth grade, with a strong tendency still further upward.

In other words, no one is eligible to enter a vocational school until he has reached the point where he is equally eligible to quit school altogether and become a factory hand, an errand boy, a casual laborer of any sort. Let us remember that nowhere is it yet contemplated that attendance on vocational schools shall be compulsory. In the very nature of things, that time cannot come until we shall have available almost as many types of vocational schools as there are varieties of positions to be filled. A compulsory requirement then would necessarily look only to enforcing attendance on *some* type of school, and not to prescribing the particular type for a given individual. It is unthinkable that the state should any more desire to prescribe the particular type of school which a boy shall enter than that it should dictate the particular employment that he shall enter.

What becomes, then, of the charge that the provision of vocational education in schools makes for caste, for an undemocratic condition of society? It is clear that existing economic conditions inevitably produce social stratification. Boys who leave school at fourteen and enter upon the careers which will leave many of them permanently stranded as unskilled workmen will always constitute a social and cul-

tural class apart (fortunate for society if they do not constitute a political class apart also) from their more fortunate fellows who can prolong their education toward profitable vocations. But is there anything at all in current proposals for vocational education that will aggravate this situation? Is it not clear, on the contrary, that every step in the provision of practical education towards earning competency will lessen rather than increase the rifts between different economic classes?

8. **Should Vocational Education be Compulsory?** — For the present, of course, it would be futile and ridiculous seriously to propose to make attendance on vocational schools obligatory, since we have so few facilities available, and especially because we have no adequate knowledge yet of how to organize and conduct schools for vocational education towards the great majority of callings. Nevertheless fundamental principles are clear enough. In a democratic society, as in any other society, the social good takes final priority. The ignorance, short-sightedness, or selfishness of individuals or their immediate guardians cannot be allowed to work ill to the commonwealth. It is an evil thing for the larger group when a given individual, naturally qualified, is unwilling, or unable by virtue of neglected education, to produce enough to support himself and to aid in meeting the common needs of the group.

Society now lays upon the normal adult the positive responsibility of providing for the support of himself and those towards whom he has assumed legal obligations for support, under normal conditions of economic production. The vagrant and family deserter can be sent to prison. But if experience should show that inability to produce adequately is in many instances due to failure to take advantage of available opportunities for vocational training then it will seem as logical for society to move towards compulsory vocational as it is now for it to require com-

pulsory literary education or observance of the essentials of sanitation.

One novel difficulty will be encountered. There is but one *reading* or *writing;* there are thousands of vocations. Who shall decide what vocation a given person shall be *compelled* to learn? Probably present approved practices of providing vocations for adults will give guidance. Society now, except in time of emergency, like war, does not force adults into particular vocations; in democratic spirit it leaves that choice to the individual so long as he seems to make reasonably effective use of his freedom. But if he refuses to enter upon a vocation — to go to work — then society forces him into a prison or " workhouse " where those occupations which can be carried on under prison conditions — rock breaking, jute weaving, shoemaking, road-building, chair caning, broom making, and the like — are prescribed.

We can imagine a state which has provided or guaranteed facilities for vocational education towards every local vocation. The youth would be given free opportunity to elect according to his taste, subject to the condition that society would limit entrance to vocations, the normal " absorbing " capacity of which is known. If a given individual, after enjoying opportunities to do so, gives no promise of choosing and properly qualifying himself for a vocation, then society would compel him to choose a field in which educational procedures for " recalcitrant squads " were known to be effective. In times past English courts used to sentence minors or vagrants to the navy. We now commit young delinquents to what were formerly called " industrial " schools where, under compulsion, they are supposed to learn a trade.

Eventually society will exact a guarantee that every youth shall become vocationally efficient before it is too late; but it will leave to him the largest practicable amount of freedom by which he will meet the social requirement.

9. **Control of Entrance upon Wage-Earning.** — In all civilized countries society now clearly asserts the right to establish and enforce minimum standards of age and physical condition for entrance upon wage-earning callings. In many cases, by systems of licensing and certification, it also determines minimum standards of vocational skill and intelligence to be met. These restrictions may appear sometimes to be imposed in the interests of the individual — as where boys under eighteen are prevented from working at machines, or youths under twenty-one are prohibited from telegraph messenger night service; but in the long run it will be found that it is the common good of the larger society that dictates these interferences with immediate individual freedom.

Does anyone seriously doubt that we are probably destined to see a constant increase in this kind of control? Doubtless it will not always be wise — that is, it will be based upon imperfect understanding of what the actual needs of society are. Doubtless restrictive legislation of this kind will often be used for exploitative purposes — since "exploiteering" reaches into many departments of life besides those chiefly affected by desires for economic gain. Nevertheless it is along this road that the forces of social economy must, in large part, travel.

We may reasonably expect extension of the principles of compulsory vocational education, as noted above; we may expect to see restrictions of numbers permitted to enter given fields (perhaps effected through competitive examination, and, when better knowledge is available, scientific "selective service"); and we shall probably witness general applications of the "minimum wage" principle.

In the past the skilled workers in a trade were often said to "own the trade"; that is, they established standards of apprenticeship, of wages, and, in large measure, the working conditions. That there should be some form of social reg-

ulation of these matters, as practiced by the historic guilds, only the most stubborn individualist would deny. Whether other social groupings than the state itself will prove competent for this purpose is still doubtful. *Laissez faire* will not do, the social economists seem to agree; vocational group control seems to lead to guild selfishness and monopoly; consumers' groupings seem unworkable; and certainly we must apprehend the blundering action of municipality, state, and nation.

One thing is clear: for any vocational field, the vocational schools should represent the best centering of appreciations of needs of the guild of trained workers on the one hand, and appreciations of the requirements of sound public policy on the other. That this has not always been the case with professional schools is to be deplored; but it would seem that medical colleges, engineering colleges, agricultural colleges, and schools of nursing have set some excellent precedents.

CHAPTER III

THE RELATION OF GENERAL TO VOCATIONAL EDUCATION

I

Origins of General Education. — The world has long been accustomed to schools for direct general education. These have only remote relationships to vocational education. Early in the progress of the evolution of modern civilization the home found itself unequal to the task of teaching children the arts of reading, writing, and computation, and hence schools were developed for this work. Under conditions where some language other than the vernacular was the medium of communication — orally or in writing — for the learned or professional classes, special schools for the classic language and its literature flourished. The evolution of the printing arts extended the fields of the general education which all were supposed to have to include at least some geography, history, and, later, science. The nineteenth century brought compulsory education in nearly all civilized countries, and the minimum education thus enforced has been measured chiefly in terms of ability to read, to write the vernacular, and to perform ordinary arithmetical computations.

Thus were laid the foundations of what we call "general" education — the education which is believed to be necessary or valuable for all, irrespective of the particular vocations which they are to follow. We must not, however, suppose that *general* education has not had and does not now possess significance as affecting *vocational* com-

petency. At all times parents, and more especially the poorer and less literate, have regarded the acquisition of the arts of reading and writing and particularly computation, as being of the greatest importance in equipping their children for the economic struggles later to be undertaken. At sundry periods the secondary school has been supported chiefly as a means of preparing selected students for professional apprenticeship or schooling. Even to-day the business house which advertises for a young helper, "high school graduate preferred," causes parents to believe that in some magical way, high school education in itself and apart from its selective effects (which is in reality the result of chief importance to the employer), lays important foundations for specific vocational success. It is even widely believed that the student who, prior to his course in a college of medicine, law, or engineering, completes a liberal arts course in a college of general education, is thereby assured of greater ultimate success in his vocation.

Does General Education Function in Vocational Competency? — We have, at present, no satisfactory means of determining how far and under what conditions all that schooling which by common consent we now call general education, actually functions in vocational competency in particular fields. It is clear, of course, that a person who had never learned to read, could not, however talented, succeed under present conditions in the practice of law. A bookkeeper ignorant of the multiplication table, or an engineer unable to solve a quadratic equation is unthinkable. But, taking the content of general education as now ordinarily accepted, we very early reach the point where it is impossible to do more than guess (or, easier still, to fall back on our entrenchments of tradition and prepossession) as to the connections, if any, between general studies and capacity for particular vocational achievement. A thousand hours spent on the study of Latin may be the best

possible investment of that amount of time for a youth destined to become a Methodist preacher; but the claim may be disputed with considerable probability of success. The agricultural college which requires its future graduates to have given at least six or eight hundred hours to the study of French and German in secondary school or college, may be imposing a very questionable requirement when considered from the standpoint of the probable professional success of the technical expert in agriculture. There are those who would require youths seeking to equip themselves to be gardeners or live-stock husbandmen to take courses in general physics and chemistry; but it is doubtful whether they have ever studied the actual significance, in the vocations named, of either study. In most public commercial schools, prospective stenographers are required to study bookkeeping as a vocational subject, even in large cities; but no available evidence proves that a stenographer in a large city is in general expected or desired to have this extra string to her bow.

Necessary Distinctions. — For the sake of clear thinking, it is highly desirable that we should designate and appraise as vocational studies and forms of training, only those distinctive educational procedures, the results of which can be demonstrated in some one of the vocations recognized and more or less standardized in the world of practical affairs. On the other hand, we should include within the category of general education, all those other customary or proposed school activities which are believed to possess value as contributing to forms of physical, moral, civic, and cultural well-being as these may be considered and valued largely apart from vocational competency. A straight back and well developed arm muscles are, indeed, of importance in many vocations; but they are, for even greater numbers, of importance in living effectively apart from vocation. Hence educational steps taken to insure their development are to

be classed properly as general education. The ability to read is useful in many callings and indispensable in some; but its importance for the various activities lying outside the sphere of specialized vocation — domestic, religious, civic, cultural — is so much greater, that the educator wisely insists on regarding all but some highly specialized forms of silent or oral reading — for proof readers, preachers, and, let us hope, teachers — as belonging to the field of general education. There may be some justification for holding that a moderate knowledge of algebra, physics, and chemistry is at least an important if not a necessary element in the instruction of those who are to constitute our "better educated classes"; but if requirements in these subjects are imposed in the name of vocational education, let us certainly ascertain in what vocations such knowledge or other power functions, and under what conditions affecting organization of subject matter and methods of instruction.

The need of clear thinking in these matters (as well as clear terminologies and documented analyses) is, for two reasons, especially urgent in the present educational era. First, the movement for the development of schools for vocational education has assumed large proportions and commands new forms of public support. Secondly, the actual educational values in general or liberal education of many of the traditional studies is being seriously questioned, especially by those who are applying in some degree the methods of scientific investigation in their inquiries, as a consequence of which the defenders of these studies hasten to put forth large claims as to their vocational relevancy or importance. French and German are widely urged and frequently required in the agricultural and engineering colleges of America on the grounds of what is probably largely an artificially fostered tradition, namely, that for a substantial proportion of the specialists trained in these institutions some proficiency in these languages is a distinct voca-

tional asset. The extent to which algebra is required in commercial schools is one of the curiosities in this well-supported division of alleged vocational education. Whenever the content of the curriculum of an industrial school is under discussion, the well meaning advocates of English language, literature, civics, hygiene, American history, and various sciences appear and urge in language very general and deficient in concrete instance the vocational significance of their favorite forms of learning. A not uncommon outcome of this pressure is that a school designed by its founders to be an effective vocational school for some occupation or group of occupations, and generously supported by the public in that expectation, becomes in fact simply a new and often less effective form of "general" school, and its curriculums more or less meaningless mixtures of various general and so-called practical subjects. This was conspicuously the case with agricultural colleges in their earlier years, and the weakness has by no means been completely remedied. To a very large extent, it has been true of public commercial schools, endowed and public "technical" schools (of secondary grade), agricultural schools, and even industrial and domestic science schools. The crying evil of this situation is, of course, to be found in the wholesale misdirection of energy which it entails. These hybrid schools do not usually give a fair, or in any sense acceptable vocational education; they seriously misguide the pupil as regards a possible career and his qualifications therefor; and often they make no really worthy contributions towards the true and desirable ends of liberal or general education.

II

Vagueness of Objectives of General Education. — A large part of the confusion resulting from the efforts of well

meaning citizens and educators in promoting these ill-defined and misdirected forms of education can be ascribed to the fact that educators and social economists have not as yet formulated either qualitatively or, far less, quantitatively, the specific objectives and standards of desirable or feasible achievement in those fields of education which we vaguely call "liberal," "cultural," "general," or "intellectual." Historically it has been natural for the schools to accept at their face value appraisements of the educational values of studies made by social organizations and classes supposedly representing "society" in general. Whether the fees of parents, the gifts of philanthropists, or public taxation supported schools in which children were taught the alphabet as a means of reading the Bible, or other schools in which Latin was taught as foundational to the calling of minister or magistrate, it was not the responsibility of the school to question the wisdom of its creators. If many parents, whether wisely or mistakenly, insisted that their children have opportunity, or be required, to study drawing or Latin or Spanish or cube root, it was only human that moderately prepared, incurious, harried teachers and principals should say, "We will try to give the people what they think they want." This has been, commonly, the historic attitude of such purveyors to his majesty, the public, as druggists, editors, play-managers, clothiers, fiction writers, and, at times, even physicians, judges, and theologians.

Furthermore, the enormous difficulties involved in tracing and evaluating the actual results to the individual and to society, of many specific studies have always constituted and still constitute a serious barrier to the making of workable distinctions between those outcomes of education which possess significance chiefly in connection with vocational achievement and those others which give qualities of personal culture, general intelligence, civic and moral

behavior, and physical well-being. We can, for example, teach children to "draw"; but the probable effects of such bits of skill or appreciation as they may acquire in the process on their subsequent powers, as adults, to execute drawings in their vocations or to exhibit taste and discrimination in their use of products embodying plastic and graphic art are wholly problematical. In our elementary and secondary schools, we devote no inconsiderable attention to the teaching of history, American and general; but the final social functioning of the knowledge of details and generalizations and of the sympathetic ideals and attitudes thus produced is as yet a most uncertain matter.

In fact, as regards the actual or relative values of the studies and other activities entering into so-called general education from the kindergarten through the college, we have knowledge (as distinguished from belief or faith) as to almost none, outside the very limited areas of the simple school arts of reading, spelling, writing, computation, and a very meager amount of geography and hygiene. For the rest — the kindergarten exercises, nature study, music, drawing, literature, history, calisthenics, civics, advanced arithmetic, foreign languages, and the various sciences — we still trust largely to faith, our consciences eased in a degree by the growing vogue of freedom of "election." This means that we do not yet possess standards of so evaluating these educational means in terms of things of (relatively) final or ultimate human worth that we can, on the basis of these calculations, modify, direct, control, and test the results to education of particular means and methods employed. For example, the general conviction that it is good for children of say twelve years of age, to study music gives us no satisfactory guidance as to the kinds and character of music they should study or the most effective means to be employed in its study. What are expected to be the

actual outcomes in human "values" of the study respectively of secondary school algebra, physics, English literature? It can hardly be contended that we have so defined and stated these presumptive "outcomes" that we can measure against them the success attending our efforts in teaching them (the definite character of the purely factitious and intermediate "ends" of "college admission" tests being, of course, conceded).

The marked progress which has been made in recent years in defining the theory of vocational education has brought into relief the inadequacy of our interpretations of the desirable functioning of non-vocational forms of education. The multiplication of studies now urged for recognition in schemes of general elementary, secondary, and college education forces individuals and institutions constantly to make choices, but the criteria or standards for such choices, either in sound sociology or sound psychology, are shadowy in the extreme. Unquestionably the progress of knowledge of the social sciences should soon give us more substantial theories as to the valid aims of general education than we now find stated in educational literature.

Fundamental Distinctions. — There is here submitted, tentatively and in somewhat hypothetical form, an interpretation of the respective functions of vocational and general education which, in the experience of the writer, can be of substantial service in the interests of clear thinking and definite practice. It is based upon the fact, easily grasped, that every competent adult, because of his membership in human society, stands towards the worlds of nature and art in a two-fold relationship. He is, on the one hand, a producer of valuable service (or goods, the concrete embodiments of such service), which service and goods he exchanges almost wholly with countless others for the services and goods which they produce and he wants; and, on the other hand, he stands as a recipient, a

utilizer, a consumer of the services and goods which he thus obtains in exchange.

It is clear that each competent adult is a producer of service during what we call his "working" or "business" hours. Biblical lore ascribes to Adam responsibility for making it necessary that each should labor in the sweat of his brow; but the student of social science finds ample explanation of man's commitment to industry in the competitive struggle, first for existence, and later for advanced standards of comfort — that is, of living satisfactorily. Hence, in very primitive society, men produce as hunters, fighters (for the defender or plunderer renders his group service in this way no less than the hunter), craftsmen, and the like. Later, these occupations are subdivided and added to almost endlessly until we find men and women, even in small civilized communities, who respectively render their service along such specialized lines as tilling the soil, teaching, building houses, repairing teeth, transporting passengers, publishing newspapers, distributing food, keeping roads in repair, preaching salvation, and healing the sick. But modern commerce also enables men to dispose of the products of their service at a great distance. To this same community are brought the products of the coffee-grower in Brazil, the silk grower in China, the pottery maker in England, the fur hunter in Canada, the engraver in Paris, the writer of poetry in England, and the gold-digger of Australia; indeed, by means of social and mechanical devices, we are able to extend the use of a man's products to generations whom he will never see. The American village is the very real possible recipient of the services rendered to the world by Homer, Watt, Beethoven, Pasteur, Columbus, Arkwright, Darwin, and countless others, some still recalled by name, and others whose identity has long been lost.

Now, while the science of economics has long differen-

tiated between the functions of production and consumption, the implications of the distinction for education have not been analyzed. But once we perceive that the controlling purpose of any particular form of vocational education is, directly and economically, to enhance the service-producing powers of the individual, it then becomes helpful to define the ends of a large portion of what we call general education in terms of man's capacity as a consumer, or, if that word connotes material things unduly, as a utilizer, of the services and products of service, rendered to him by others in exchange for the products of his service.

General By-Education. — But at this point in the discussion of education for utilization, we are in danger of being misled if we fail to distinguish between the by-education of home, church, press, stage, and other non-school educational agencies on the one hand, and the direct education of the school on the other. A child learns to care for wheaten bread as an article of diet through the by-education of the home. The better home establishes the hygienic ideal and practice of eating at stated intervals — meal times; while the poor home has not yet reached this standard in its by-education. Many persons learn, not through a school but from the by-effects of general association with their fellows, to care for good music, or good fiction; some thus learn eventually to care for poetry, paintings, essays, and the writings of scientists. On the other hand, it has been widely assumed in recent years that to insure a fairly sound development of taste for good reading requires the aid of the direct education possible only in schools.

In other words, when we speak of education for utilization we must keep in mind that there are many agencies offering by-education to this end, and that the educational functions of the school are in reality residual — that is, the school, maintained at large expense, is expected to devote its efforts to meeting those important requirements of so-

ciety for which the various agencies of by-education are inadequate. Hence we do not commonly use the schools to teach better standards of utilization as regards moving pictures, contemporary fiction, popular music, transportation, decorative clothing, sociability organizations, attractive foods, emotional religion, newspapers, and the like. But to an increasing extent we are employing the direct education of schools to establish right standards of utilization of literature that is not contemporaneous or at any rate "popular"; of the higher grades of music and drama; of more hygienic and refined decorative clothing; of more hygienic and sanitary ways of living; of the "art" which is believed to count in life; of the devoted work of those altruists who are willing to give far more of service than will be given to them in return; and of all that stored knowledge and ideal which makes for "life more abundantly."

The trend of civilization has long been clearly in the direction of narrowing and intensifying the field wherein any one person could be expected to render competent service, *i.e.* specialization of function; and on the other hand it has tended steadily towards the widening of his field of possible utilization as expressed in his standards of living, culture, and social participation. We speak of the former as economic specialization. It presses upon everyone to find and to follow assiduously a special line of productive work. The second tendency is the composite outgrowth of democracy, diffusion of knowledge, diversified consumption, rising standards of taste. Its final product is the "civilized" man.

What Gives Liberal Education? — Much confusion has prevailed in recent years among those who have tried to define and value liberal education as that is offered in school and college. It has not proved difficult to provide explanations in very vague and general language as to why the

various branches of general learning should be made available to all young people and even urged upon them. It has been held that everyone has a right to share in the "social inheritance"— that accumulation of knowledge, ideal, custom, and taste which the generations have rolled up with ever-increasing rapidity. We have been told in figure that the human spirit is an imprisoned thing looking forth from certain "windows of the soul," and that it is the responsibility of man in his collective capacity to insure the entry into the soul through these windows of the fullest possible abundance of light. Again, it has been held by educational philosophers that the chief aim of general education in schools should be, not the acquisition of any specified *quantum* of knowledge in itself, but rather the mastery of those tools of intellect which would insure the individual the powers, after leaving school, of acquiring for himself, from one or many of the fields of human knowledge, such personal possessions as he might desire. A modified form of this theory is found in the belief that the chief function of the more advanced forms of general education is to be found in "mind training"— in which the mind is conceived as possessing points of analogy to the body which, in gymnasium and on athletic field, can be made strong, pliant, and enduring against all the needs that may later befall.

But it is not apparent that these philosophical speculations as to the desirable ends of general education have given us the means wherewith to ascertain the comparative validity of the various specific ends among which choices must constantly be made, nor have they served to indicate by what methods these respective ends could be met. It is not apparent, for example, that the various theories thus far promulgated as to the desirable or feasible purposes of general education have aided us in determining whether Greek should or should not be required or urged as a factor

in secondary or collegiate (liberal arts) education. We have obtained from these sources no useful criteria whereby, for purposes of liberal education, we could comparatively evaluate the study of the modern languages as against that of classic languages; of classical English literature against modern English literature; or of mathematics and the sciences against the so-called "humanities."

Worse still, from the standpoint of educational efficiency, we have obtained little or no assistance in determining what constitutes, or should constitute for any commonly accepted division of knowledge or training, optimum quantities or areas. What shall we accept, in chemistry, for example, as a desirable and practicable amount of knowledge or other mastery to be required or encouraged? What position and what scope shall we give in secondary school and college to music? art? ancient history? oriental languages? translations or classic literatures? contemporary events, history in the making? We are still wanting a theory of the purposes of general education sufficiently definite and serviceable to enable us to procure, on the basis of it, answers to questions like these.

The theory set forth above — namely, that general education should be interpreted chiefly from the standpoint of the needs of man as a utilizer rather than as a producer — needs, of course, extended analysis at numerous points. Certain of the earlier disciplines of the elementary schools — notably reading, writing, and numbers — commonly function visibly among the efficiencies of man, both as a producer and as a utilizer. But the primary justification for their inclusion in programs of general education is, of course, their fundamental importance to good utilization.

Again it is apparent that one indispensable element in sound vocational education is trained power of utilization of those materials which serve in production. The expert mechanic must make use of some phases of mathematics,

drawing, mechanics, and other so-called technical studies. He requires certain definable powers of discrimination and evaluation in choosing his tools, materials, and other working conditions. He can usually employ to advantage any and all knowledge he may possess as to accounting, laws affecting contracts, prevailing market conditions of materials and labor, recent labor-saving inventions, etc. In these special fields, then, he must be an effective utilizer. But, for most vocations, these fields occupy but a small area in contrast with the non-vocational fields of utilization with which he should be concerned. Training a person towards sound utilization within his expected vocational field is, of course, a necessary and feasible part of vocational education. Much of the education required for this purpose — the accumulation of wide technical knowledge, the fixing of right standards of taste and discrimination, the building up of ideals — will in reality accrue as by-education accompanying the development of skill in, and concrete experience with, productive work.

Education for Utilization. — A more fundamental question left, thus far, unanswered, requires an interpretation of what we mean by "education for utilization." We have already seen that the by-education of home, street, and other private agencies accomplishes much in preparing youth to be utilizers. What is or should be the actual residual function of school and college?

We note, in the first place, that utilization, like production, has its social, no less than its more easily perceived individual, conditions and consequences. Low standards of utilization in art, music, fiction, decorative apparel, beverages, travel, and companionship may, conceivably, not harm a particular individual or make of him less of a man than he might otherwise be; but the contagion of his example may be capable of working a social injury. Again, it is a well-known axiom of the commercial world that

demand greatly affects, when it does not completely determine, supply. Every additional buyer of mendacious newspapers strengthens their position and correspondingly weakens that of the more reputable press. The undiscriminating buyer of packed foods places a persistent premium on adulteration, misbranding, and unstandardized production. The man who is complacently indifferent to the world's accumulation of scientific knowledge is making it harder to add to that knowledge in the future. The woman who seeks, in the purchase of clothing, only her personal satisfactions, may be placing a large premium upon goods produced and sold under bad conditions. She thus handicaps all efforts to raise standards of production and exchange. The man who takes no pains to choose between competent and incompetent medical service is giving to quackery a large advantage in the competitive struggle which always goes on between scientific and pseudo-scientific medicine. The voter who is satisfied if the employee — congressman, sheriff, waterworks engineer, teacher, policeman — whom he, in common with his fellow voters, elects for the performance of important public tasks, is merely a "good fellow," an approved member of the "gang," is, by his own complacency and low standards heavily handicapping the public service and deferring indefinitely the day of cleaner politics.

In all departments of human utilization, — religion, science, history, literature, dress, foods, exercise, housing, companionship, places of residence, expert service, language, politics, and the like, — incessant competition prevails between high and low standards, whether these be viewed from the standpoint of the immediate apparent welfare of the individual or from that of the larger well-being in which the society of which the individual is a member has interests no less than himself. The gradual development of direct education through schools as a means of

insuring higher and more social standards of utilization is clearly in accordance with sound social economy. Hence, the fatuity of the assertions, sometimes made even by educators, that we need less of so-called liberal education and more of vocational education (" in schools," being meant in each instance). As standards of living improve, as man emerges into a true civilization, we shall ever need more extensive and better organized liberal education. Equally, however, we shall need in increasing amounts and varieties, vocational education in proper season for many if not for all those prospective producers whose equipment for vocational activities cannot readily be procured through the by-education of home, shop, office, or farm.

Much of the present prevailing confusion in educational thinking is unquestionably due to our failure adequately to distinguish between cultural and vocational aims. Practical men are still accustomed to look for the fruits of general secondary or college education in the forms of vocational competency. Does a college education pay? Business men and educators debate this question, naïvely assuming that a primary purpose in a liberal arts college course should be an equipment wherewith to earn a living. The obvious reply, of course, should be that it is no purpose of a college course to equip a man to earn a living, hence it is unwarrantable to try to gauge the success of a college education in these terms. If evidence were available, it would undoubtedly show that college men in general " succeed," in the economic sense of that term, to a greater extent than non-college men, just as high school graduates doubtless succeed better than their fellows who have not entered, or, having entered, have not completed, a high school course. But to assume that such success is in considerable degree to be attributed to their direct education obtained in these institutions is to indulge in rankest form in that species of fallacious reasoning denoted by

the phrase "*post hoc, ergo propter hoc.*" It is patent to any observer, of course, that in the statistical sense, only the biologically, psychologically, and sociologically best of our people — best, that is, as respects native abilities, results of early environment, effects of the by-education of home, street, church, etc. — enter the high school; of these only a still more select superior class graduate; and of these in turn, only the few of most promise (on the whole) graduate from college. Generally speaking, success is the destined lot of these superior persons, quite regardless of the kind of general education they have received.

Illusions of Mental Discipline. — As a matter of fact, much existing confusion regarding the possible functioning of general education derives also from the insecure educational foundations long ago laid in the quicksands of the so-called "faculty psychology." The will-o'-the-wisp of mental discipline has allured into the bogs of educational mysticism at one time or another nearly all educators. The delusion originates somewhat as follows: a given subject of study or training (a favorite with the proponent, of course),— *e.g.* Latin, algebra, mechanical drawing, joinery, stenography, physics, hygiene, music, Browning, eugenics, — requires for its effective mastery close application, organized effort, and vigorous and sustained use of the "mental powers"— the memory, observation, concentration, logical reasoning, imagination, appreciation of scientific method, etc., etc., of the older psychologists. This favorite subject in fact appears to require the exercise and development of these powers almost more than any other subject known to the proponent; hence, altogether apart from its value as contributing to the building of useful or interesting knowledge, tastes, skill, and ideals, it seems to him to be an unequaled subject for the discipline of the mind. But the disciplined mind is fundamental to all forms of success in

life, — cultural, vocational, civic. Hence, even if its "content" value is insignificant, the aforesaid favorite subject should be given prominent place, should even be required of all students because of its virtues as a mental gymnastic. The "trained mind" of course, functions no less certainly in business and other practical affairs than in the less materialistic commitments entailed by membership in civilized society. Hence the persistence of fallacies as to the bearings of the disciplinary studies of school and college on "practical," *i.e.* vocational activities.

It is only when we come to inquire in all seriousness whether "mental training," "mental discipline," the "trained mind" and other phrasings of the same conception, denote realities with which educational processes as now organized can deal that we are confronted by the utterly factitious character of much of the so-called thinking which has heretofore prevailed in this field. It is only when we find that the world recognizes under each of the vague generic concepts, expressed by such phrases as "reasoning power," "memory," "observation," "imagination," "scientific method," "enthusiasm," "analysis," a whole host of possible highly specialized powers, some useful, some ornamental, some useless, but in many cases quite unrelated to each other, that we begin to get our feet on to the solid grounds of reality. We then find that there is a large variety of specific mental powers and other acquisitions which can be acquired through the customary processes of general education and which have an important place in personal culture or civic capacity (two useful subdivisions of liberal education or, as here interpreted, education for utilization), but which have no discernible relation to vocational competency. Vice versa, it is possible to enumerate in the constitution of any individual adult, a large variety of special mental attributes of the utmost importance in vocational competency, but which

are only remotely related to personal culture or civic capacity. Close analytical thinking in the directions here indicated will do much to dispel some of the fogs of illusion which have darkened the way of progressive measures toward a truly modern liberal education and which have equally retarded in a score of ways the evolution of systems of effective vocational education.

The "Vestibule" Conception. — Men and women whose experiences and prepossessions relative to "education" have been developed almost exclusively in connection with "academic" or "general" education are prone to think of vocational schools as extensions *upward* from schools of general elementary, secondary or collegiate education. For practical purposes such a conception is much less useful and is more misleading than that which regards any particular type of vocational school as an extension *downward* from, or as a *vestibuled* approach to, a specified vocation itself.

Many vocations require such maturity on the part of their entrants that no direct connection can be established between the school of general education and the vocational school. For example, men do not usually become locomotive engineers, policemen, sailors, traveling salesmen, street car conductors, farmers or school principals on, or soon after, leaving schools in which they have received their general education. On the other hand, custom, at least, has established that lawyers, physicians and teachers can and should begin their vocational education immediately at the close of their respective periods of liberal education. A very large proportion of operative positions in factories are open only to mature workers, although in many cases presupposing no "promotional" approach through stages of work suited to younger hands.

Of similar nature is the vocation of homemaker. As shown elsewhere in some detail, American women are rarely ready to enter a genuine vocational school of homemaking

at the close of (*a*) the elementary school period for the least able and prosperous, or (*b*) at sixteen for the slightly more able and prosperous, or (*c*) at eighteen or twenty-two for the economically superior classes. For the large majority of urban girls at least, several years will usually elapse between the close of general schooling and entry upon " full responsibility " homemaking.

In all these cases, it is obviously more practicable and serviceable, in planning for vocational education, to think first of the vocation itself — its scope, the usual age of entry upon it, its requirements of age, physical strength and other qualities to be obtained by selection — and from this point of vantage to decide upon the place and character of a suitable vocational school.

Under these conditions, liberal or general schooling will long antedate vocational schooling. In fact it is probable that, given an abundant supply of facilities for vocational education, the life history of many workers will be as follows: Stage I (age 6–14), full time general education. Stage II (age 14–16), full time general education. Stage III (age 16), one third year to full time vocational education for juvenile specialty, with " extension " general education in evening. Stage IV (age 16–19), juvenile full time employment, cultural education in evening. Stage V (age 19–20), one third or one half year of full time training for " manhood " specialty or " upgrading " work. Stage VI, wage-earning employment, with evening and other extension improvement or upgrading courses. Of course the youth should be urged (eventually required) to remain in school of general education as long as it is clearly profitable (to society or to himself) to do so.

Can There be " General Vocational " Education? — Many educators are seeking the philosopher's stone in vocational education — the one precious means that, reversing the alchemist's dreamed-of process, will transmute ordinary

school instruction and training into any one of hundreds of special forms of vocational competency. At least they hope to find one panacea to produce "agricultural" competency; another to produce "industrial" power; and a third to provide education for "business life." These educators have to serve the "small community"; they perceive easily enough that local youths growing up in the vicinity will want to disperse into scores of vocations, for each of which it is utterly futile to provide special vocational schools locally.

Hence one quest is for subjects of study common to many vocations. Why not teach "shop mathematics," "business English," "agricultural science"? Another is for a composite course to prepare young men to be "all round" or general mechanics as these are supposed to be needed in rural and village communities.

The probability seems strong that very little hope exists for "general vocational" education of any sort. There are several reasons for this. First and most important is the fact that in proportion as we seek *common* elements or factors in vocational competency we move rapidly towards the abstract and general. For example, tailoring, sheet metal work, and carpentry, each requires special mathematics; but to teach a *common* shop mathematics for these three trades we must either teach the special mathematics of three different trades to people who will require only that of one, or else teach a mathematics that will differ little from general mathematics and will prove just as remote from real life and difficult for the average student to apply. Doubtless there are common elements in the special sciences that underlie machine shop practice, printing, and electrical work; but these common elements are too abstract and elusive for the average "thing minded" learner. Doubtless, too, the logical thinker among educators can discover many common elements in the mechanical drawing re-

quired respectively by plumbers, automobile repair men and plasterers; but the practical worker usually turns in disgust from all attempts to teach such "general drawing." Practically it cannot be made to function for him.

In the second place, it is not in evidence yet that the future has a place for the jack-of-all-trades, even in rural communities. The repair of rural pumps, harvesters and telephone lines is usually given to specialists who come from central points. Where disabled machinery cannot be repaired by replacing a part it is likely that the whole will be sent to a central repair station, as is the case now with clocks, shoes and automobiles. Easy transportation, parcel post, interchangeable parts, peripatetic crews of fence builders, well diggers, silo builders, house painters — these modern developments render it less likely than ever that we shall find a place waiting for the future "ready" mechanic in rural and village districts. The entire subject, however, demands further study.

III

The Commission on the Reorganization of Secondary Education (of the National Education Association) published its "Cardinal Principles" in 1918 (Bulletin 35, 1918, U. S. Bureau of Education). The commission holds that seven "main objectives" should determine all secondary school curricula — health, command of fundamental processes, worthy home-membership, vocation, citizenship, worthy use of leisure, and ethical character.

In general, the commission holds that general and vocational education should be carried on side by side in secondary schools. In fact it recommends that the senior high school have its courses differentiated primarily on a vocational basis. The following quotations give the essentials of the commission's findings.

"The tradition that a particular type of education, and

that exclusively non-vocational in character, is the only acceptable preparation for advanced education, either liberal or vocational, must therefore give way to a scientific evaluation of all types of secondary education as preparation for continued study. The broader conception need not involve any curtailment of opportunities for those who early manifest academic interest to pursue the work adapted to their needs. It does, however, mean that pupils who, during the secondary period devote a considerable time to courses having vocational content should be permitted to pursue whatever form of higher education, either liberal or vocational, they are able to undertake with profit to themselves and to society." . . .

"The work of the senior high school should be organized into differentiated curriculums. The range of such curriculums should be as wide as the school can offer effectively. The basis of differentiation should be, in the broad sense of the term, vocational, thus justifying the names commonly given, such as agricultural, business, clerical, industrial, fine arts, and household arts curriculums. Provision should be made also for those having distinctively academic interests and needs. The conclusion that the work of the senior high school should be organized on the basis of curriculums does not imply that every study should be different in the various curriculums. Nor does it imply that every study should be determined by the dominant element of that curriculum. Indeed any such practice would ignore other objectives of education just as important as that of vocational efficiency." . . .

"The comprehensive (sometimes called composite or cosmopolitan) high school, embracing all curriculums in one unified organization, should remain the standard type of secondary school in the United States." . . .

"When effectively organized and administered (see pp. 27–29) the comprehensive high school can make differen-

tiated education of greater value to the individual and to society, for such value depends largely upon the extent to which the individual pursues the curriculum best suited to his needs. This factor is of prime importance, although frequently ignored in discussions regarding the effectiveness of vocational and other types of differentiated education." . . .

What is Genuine Vocational Education? — In the estimation of the present writer[1] the report of the commission almost completely misses the significance of the contemporary movement for the extension of vocational education in schools. The apparent failure of the commission to take account of available sociological and especially economic guidance in this field of education is almost disastrous because it warps their underlying principles at almost every point. To an educator who has tried to comprehend the sociological and psychological significance of the current demands for better vocational education, the entire philosophy of the report seems almost hopelessly academic in the unfavorable sense as it relates to vocational education. (The writer is not aware that any one of the members-at-large of the reviewing committee has at all identified himself with recent movements for vocational education; and he wonders how closely the three chairmen of the vocational committees scrutinized the "cardinal principles" before approving them.)

It is difficult to believe that the committee gave close consideration either to the history of the evolution of school vocational education as thus far developed, or to the standards and conditions affecting the more than two thousand vocations now followed by juvenile and adult workers in the United States.

[1] The material of this section first appeared as an article. The somewhat controversial form has been retained as a matter of convenience.

It will generally be conceded that effective vocational education through schools (that is, instruction and training sufficient to guarantee successful practice of the vocation under commercial conditions without subsequent period of apprenticeship) is now found only for such vocations as those of the physician, dentist, pharmacist, veterinary surgeon, mining engineer, surveyor, nurse, elementary school teacher, stenographer, naval ensign and army lieutenant. School training for these vocations now proceeds in accordance with determinate standards. In most cases definite goals of attainment are set. The instruction and training are basic, not merely extension. Conditions and standards of practical achievement, no less than related technical and social studies, have been established as part of the educational process.

Now it seems to have escaped the attention of the committee that the modern movement for vocational education rests essentially on social needs and demands that schools shall be provided wherein young men and women may be trained for several hundred different vocations no less effectively than are persons trained for the dozen enumerated above. From the psychological point of view there is not the slightest reason why suitably qualified persons should not, through special schools, be trained effectively for such vocations as tailoring, jewelry salesmanship, poultry farming, coal cutting, stationary engine firing, waiting on table (hotel), cutting (in shoe factory), automobile repair, teaching of French in secondary school, mule spinning, power machine operating (for ready made clothing), raisin grape growing, general farming suited to Minnesota, linotype composition, railway telegraphy, autogenous welding, street car motor driving, and a hundred others.

And from the sociological point of view, taking account sometimes of the needs of society (the end that prompts the establishment at public or philanthropic expense of nor-

mal schools, military academies, and nurses' training schools) or of the needs of the individual who must be helped to acquire competency to practice a vocation for self-support (the end that prompts the support, often on a purely commercial basis, of schools for stenography, law, mining engineering, and automobile driving) there may be exactly as good, if not better, reasons for the provision of vocational schools for these heretofore unsupplied fields as for those for which vocational schools were earlier developed.

Unreal Vocational Education. — It is possible that the committee has been confused by the numberless attempts in recent years to realize some of the supposed ends of vocational education through courses giving information *about* vocations or through courses supposed to provide for the inferred needs on the part of workers for technical knowledge anticipatory to practical participation in the productive work of the calling itself. The hundreds of programs of vocational extension education now provided in evening and other schools, especially for the agricultural and handicraft callings, are of course worthy of the highest approval; but these have nothing in common with the hundreds of other attempts made in recent years to teach from books, supplemented by a little laboratory illustration, the principles of farming, electricity, shop mathematics, mechanical drawing, commercial law, home economics, bookkeeping, woodworking, counter salesmanship, printing, and dressmaking to young persons long before these learners have actually entered upon the initial practice of their callings and often before they have consciously differentiated callings which they really expect to follow. The numberless attempts of school men, pressed by public demands for vocational education in the interests either of individual youth or the productive needs of the community, to offer the foregoing substitutes for genuine vocational education

have done much to prejudice all *bona fide* proposals for vocational education under the auspices of the established public school authorities.

The educational philosophy of the committee leads to the remarkable proposal that the basis for the differentiation of the curricula of the senior high school should be vocational — "In the broad sense of the term"—"thus justifying the names commonly given such as agricultural, business, clerical, industrial, fine arts, and household arts curriculums." But "provision should be made also for those having distinctively academic interests and needs."

Once, indeed, in the report, we find a statement of the purpose of vocational education that can be approved. "Vocational education should equip the individual to secure a livelihood for himself and those dependent on him, etc." But within twenty lines we find "the extent to which the (*sic*) secondary school should offer training for specific vocation depends upon the vocation, the facilities that the (*sic*) school can acquire, and the opportunity that the pupil may have to obtain such training later." Is this to be interpreted as meaning that the committee would ban all public school vocational education that could not conveniently be brought within its "comprehensive high school"? No one doubts, for example, that if the methods of apprenticeship should one day be found manifestly unsatisfactory as means of training men to be locomotive engineers, it would be entirely practicable to establish in the United States a half dozen schools that would do that work no less effectively than schools for dentists or schools for nurses now do their work. Is there any question as to whether such schools could obtain needed facilities? A few score miles of track, a hundred locomotives, a couple of repair shops, a half dozen class rooms, and working part-time arrangements with a few neighboring railroads — these would be sufficient. Such schools could apply enter-

ing tests, could base technical knowledge on practice, could easily impart social and health insight and standards, and could graduate locomotive drivers tested and certificated no less than are now ensigns and pharmacists.

But if we tried to teach this calling in a comprehensive high school it would, of course, be difficult to provide all facilities. We could restrict admission to those over 20 years of age; we could perhaps get a second-hand locomotive and 30 feet of track into a basement room; and of course we could also provide a nice library and some elaborate drawings. But with all that would not the practical man say we were playing at the job instead of working at it? The committee does say that only men should teach in a given field who are skilled in productive work in that field; and that " the actual conditions of the vocation should be utilized either within the high school or in coöperation with the home, farm, shop or office." But all of this is still very indeterminate until it has been analyzed in terms of at least a few hundred of the typical vocations which men and women now follow. The committee should in any future elaboration of its cardinal principles procure the coöperation of a few persons who can apply sociological methods to the determination of the specific aims, place, content, and methods of several hundred types of vocational education. As a matter of fact these methods are now much more readily applicable to the discovery and formulation of programs of vocational education than to the specific objectives to be provided under any of the other main objectives set forth by the committee.

The Vocational Survey. — The method would be applied somewhat as follows: A vocational survey of a given community shows that there are represented among others the following vocations (the workers being between twenty and fifty years of age and therefore past the usual stages of apprenticeship): 100 women stenographers of whom 20

can be rated good on a scale of "excellent," "good," "fair," "poor" (standards being found partly in earning power and partly in general proficiency independent of immediate earning power); 20 dentists, 10 good; 200 grocers' clerks, 60 good; 40 handicraft tailors, 15 good; 500 homemakers on budgets of $800–$1,200 per year (average four children, living in detached house), 260 good; 30 journeymen barbers, 20 good; 10 trained nurses, 8 good; 40 hotel waitresses, 10 good; 100 factory specialists in furniture making, 20 good; 200 factory specialists on ready made children's clothing, 60 good; 20 market gardeners (owners and "full responsibility" tenants), 3 good; 20 elevator girls (18–25), 5 good; 50 normal school trained elementary teachers, 28 good; 5 high school teachers of history, 2 good; etc.

With regard to each of these various vocations educational sociology at once proceeds to ask: (*a*) Have the methods of vocational education (mostly non-school, of course) by which all the foregoing workers (the excellent, the good, the fair, and the poor) reached their present proficiency been quantitatively sufficient to provide society with sufficient productive service in these respective fields? (*b*) Have these methods been such as to provide a reasonable number of openings for that army of youth looking for opportunity to participate in the world's work and who normally strive forward into these callings? For it is certain that in a crowded world and a dynamic social order and a democratic civilization ambitious individuals must, within reasonable limits, be permitted to "crowd" for places or to make them, otherwise we shall have large occupationless classes, excluded from monopolized vocations. (*c*) Have the methods by which the "good" workers (and, making allowance for hereditary advantages, no less the "excellent") reached their present proficiency been reasonably expeditious, humane, unwasteful, vocationally effective, and not productive of harmful physical, civic, domestic, and cultural by-products?

For example, it might be found that present methods of getting waitresses and elementary school teachers are reasonably good, judged by the standards that could be established under the foregoing questions; that the methods of getting poultry farmers, dentists, and handicraft tailors do not give enough of such workers; that the methods of providing nurses and furniture factory specialists are good, but too exclusive, since they deprive some persons of opportunities to enter and compete for a livelihood in these fields.

The facts thus assembled give us a basis for the evaluation, in terms of various practicable standards, of existing methods of vocational education. The fundamental question now is: What can, and what shall we do for the training of the next generation of workers in each of these fields? This question immediately resolves itself into three questions: (*a*) Where, for a given calling, vocational education has heretofore been chiefly by-education (a by-product of participation in productive work) what can be done by society, possibly acting through the state, to improve it while still leaving it as by-education? (*b*) Where methods of by-education are demonstrably ineffective or wasteful of human well-being, as is the case in the writer's estimation with a large majority of the more than 2000 distinctive vocations now followed by Americans, when and where and how can we provide means of direct vocational education (that is, specific vocational schools) for these callings? (*c*) Where direct vocational education now controls in filling certain callings — *e.g.* surveying, electrical engineering, soil analysis, bookkeeping, and law — if it is found that results are wasteful or otherwise ineffective, what shall be done to improve the existing vocational schools?

In the study of many callings, certainly, we are soon forced to conclude that effective vocational education for

the future can only be given through specially designed agencies for that purpose. Here, then, begins the quest of standards for such education as applies to particular callings. Reaching this point, the man of academic possession almost certainly falls back on a carefully cherished set of *a priori* principles. He loathes the task of being held to consideration of a specified calling. Ask him, as the outcome of the inquiries suggested above, how he would proceed to devise programs of direct (vocational school) education for, respectively, barbers, farmers producing milk as a major and apples as a minor income crop, cooks for small hotels, marine firemen, field salesmen of drugs, reporters, telephone linemen, country newspaper editors, pressmen in book and newspaper printing, tobacco growers (as major), bank cashiers, vampers in shoe factories, moving picture operators, and homemakers on budgets of $700 to $1,000 — in the event that the ineffectiveness of the non-school methods of vocational education heretofore followed can be demonstrated — and he is at once balked. For what ages should vocational schools for each of these vocations be available? Why? For which sex if not both? Why? What should be prerequisites for admission? Why? What should be the length and character of practical training through productive work? Why? What should be the length and character of short or long courses or related technical, social, and physical education? Why? What should be standards of completion of training, of graduation, of approval for employment? What should be the expected or guaranteed character of subsequent non-school vocational education? Why? What should be the character of expected or guaranteed opportunities for subsequent extension education? Why? What should be the expected or guaranteed opportunities for promotional or other upgrading education? Why?

Vocational Education vs. Civic Education. — A very considerable part of the confusion of the committee as regards vocational education can be attributed to its failure to distinguish between the study of vocations for the purpose of civic understanding, guidance, and cultural enlightenment, and the study of (and productive practice in) given vocations for the sake of becoming efficient producers.

"Furthermore, it is only as the pupil sees his vocation in the light of his citizenship and his citizenship in the light of his vocation that he will be prepared for effective membership in an industrial democracy," says the report. This is somewhat mystical because so few of us yet understand what is meant by industrial democracy. Are the peoples of Vermont, Texas, Massachusetts, Boston, Bridgeport parts of industrial democracy? Are the physicians, orange growers, bank clerks, factory shoemakers, school teachers, street car motormen, editors, coal miners, colored cotton growers, department store clerks, all (or any of them) members of an industrial democracy?

There can be no question as to the righteousness of the ideal underlying the committee's contention, if we waive the difficult implications of the words "industrial democracy." Every man should see as fully as practicable the relationship of his vocation not only to his citizenship, but to his domestic life, his health, his religion, and his personal culture.

In part these interconnections can be studied in connection with the vocational guidance, the practical arts practice, and study of the civic or social order, all of which are factors in the liberal education which is the legitimate purpose — the central obligation in fact — of the liberal arts secondary schools to supply to all pupils as long as they can be induced to remain in that school.

On the other hand, any genuine vocational school (*e.g.* in medicine, elementary school teaching, stenography) now

instructs its students in the physical and social knowledge and especially in appreciations that are significant and pertinent to the vocation being learned, all of which must of course differ from one vocation to another. These are two perfectly practical lines of approach to the interrelation of objectives desired by the committee. But until we can see some of the practical programs exemplifying the committee's somewhat vague, if not mystical, proposals, we shall hardly know whether what they have in their minds involves training for the successful practice of vocations or merely some controlled development towards appreciation of vocations.

We should all greatly like to bring it about, of course, that lawyers and factory hands, coal miners and bank clerks, waitresses and nurses, elementary school teachers and department store clerks, could and would meet always together in club and home on terms of friendly equality and fullest mutual understanding. If the committee thinks it can achieve these results or contribute to them by refusing to approve any supposed divorce (which probably does not exist now in any well developed system of school vocational education) of social-civic education from vocational education, then the end would certainly justify substantial sacrifices. But we have much to learn as to necessary limitations of the two types of education from those vocational schools that are provided for our people of greatest ability — our military academies, engineering schools, law schools, normal schools, colleges of medicine and of dentistry!

The members of the committee are chiefly, and rightly, occupied with the liberal education of youth of secondary school age. They cannot, however, ignore the growing strength of motives for vocational participation manifested during these years of adolescence. Hence it would seem that they desire to seize upon these vocational motives and use them as means of furthering liberal education, even

though the expectations of the large majority of pupils might be disappointed and their energies misdirected in the process. The committee favors the subordination of deferred values, and yet, from the standpoint of the critic it seems actually to sacrifice present values to values almost indefinitely deferred where genuine vocational education is involved.

In spite of its seeming insistence to the contrary it is hard to believe that the committee is genuinely interested in any vocational education that can meet the economic tests of our time. Nowhere does it employ the language or the illustrations accepted in current discussion of vocational education. Hardly at all does it allude to the social demands that are pressing vocational education forward as one of the large movements in social economy. Towards all current problems, intricate and baffling, of vocational education the committee maintains a serene scholastic aloofness, possibly the same slightly contemptuous indifference which characterized the attitude of our scholastic forbears towards manual labor in general. At least the committee can have only itself to blame if it gives that impression to many readers.

The foregoing criticism must not be interpreted as an expression of opposition to the commission's general findings as to the need of more extended and better secondary education of all sorts. It is simply a protest against the impracticability of the submitted proposals to provide so-called vocational education in "comprehensive high schools." Such procedure may result in prolonged general education but it will give no sound vocational education.

CHAPTER IV

PRINCIPLES OF METHOD IN VOCATIONAL EDUCATION

The Imperfect Science of Educational Methods. — Back of all educational practices lies a multitude of special and, certainly, a number of general pedagogical principles. In their fundamental aspects, obviously, these must rest on the psychology of learning; but in many of their derivative aspects they rest also on social and administrative conditions.

The pedagogical principles of non-vocational education are as yet only partially understood. In producing the skills involved in the primary school arts — reading, writing, numbers — teachers have long known the values of repetition, drill, and concentration. Lately they have come to attach value to motives of attraction rather than compulsion. And it is now an accepted principle in all good training that the realistic associations and values of the step in the process should, in the interests of effective learning, be well comprehended as well as approved by the learner.

But when we get beyond the elementary stages of general education our grasp of principles is still very meager and unsatisfactory. We know almost nothing of the principles to be followed in making moral education effective under present-day conditions. We talk endlessly about training our pupils "to think" but when analysis reveals the illusory character of some cherished panacea we have no reserves as yet to fall back upon. In accordance with what principles can we produce the "appreciations" of literature, music, plastic art? We can only make surmises as yet. How shall we proceed to make of the youth of fourteen a

" good citizen " against his voting days at twenty-one? We still flounder amidst guesses and random experiments.

Hence it need not surprise us to find how few and unsubstantial are our " principles " of method for vocational education in schools. Even in the professional colleges where trial-and-error discovery of methods has been proceeding, in some cases for centuries, pedagogic practices are largely based upon customary methods and means which always tend to become " traditional " in the strict sense of the term — that is, " handed on " by processes of imitation, and uncritically.

Nevertheless it is practicable to derive empirically certain tentative principles which can help in practice. Eventually we may expect the psychologists to give us the materials for reasonably scientific methods, both of general and of particular application.

I

General Analysis. — 1. The word " method" is here used in a comprehensive sense as covering the more specific means and methods, apart from administration and organization, of realizing a stated aim in education. Effective educational procedure presupposes clear-cut definitions of ultimate aims and then of proximate aims to be realized; analysis of the necessary means and methods by which they are to be realized; the provision of an organization and administrative control adequate to the handling of these necessary means and methods; practice or procedure in realizing aims; and finally, the testing of results, the realization of which has been contemplated from the start.

2. It can well be assumed that, in the main, effective methods in a particular field of vocational education can best be derived primarily from study of the vocation in which proficiency is sought. In other words, each distinctive field of vocational education may be expected gradually to develop an extensive system of special method. Already in

schools for the training of lawyers, dentists, agricultural experts, electrical engineers, elementary school teachers, telephone switchboard operators, stenographers, and military leaders, a very extensive methodology has been evolved. Equally, it may be expected that in schools for the training of loom tenders, spinners, cutters in shoemaking, screwmakers, motormen, counter-salesmen, gardeners, homemakers, power-operators in cloth manufacturing and the like, in every case a special methodology will be provided.

3. Nevertheless, following the analogy of other fields of education, it should be possible also to state certain general principles probably applicable in all fields of vocational education. In the endeavor to arrive at these general principles careful attention should be given to the methods followed throughout the ages in achieving vocational competency by means of vocational by-education, especially should organized apprenticeship prove fertile in suggestion.

4. Obviously, any discussion of methods in particular fields of vocational education is dependent upon clear-cut differentiation of aims to be achieved. These may be expressed in terms of proximate aims, that is, in terms of productive competency for near and limited periods; or else they may be so stated also to include expected final stages to be reached and also with reference to the possibilities of advancement, promotion, passage from one calling to another that may all be involved.

5. Again, the principles of motivation should be given consideration. At the present time, when attendance on a vocational school is not obligatory except in the case of that very limited number of young persons who may be committed to reform schools or reformatories, it should be accepted as a first principle that no vocational education can really be worth while except in the case of the individual who is already desirous of equipping himself for competency in the vocation selected. As far as practicable, vocational

guidance should be employed to confirm the youth in the wisdom of the choice that he has made. Again, any normal provision which the vocational school itself can make for the stimulation of active learning motives on the part of the student, such as an easy sequence of stages of learning, special exercises for assisting him to pass difficult points, maximum opportunities for concrete participation, especially for students who find abstract learning difficult, sound evaluation of results of learner's work at every stage and, finally, the giving to the learner of the commercial rewards for his work at the earliest possible stages, deserves fullest practicable development. All of these may be regarded as legitimate and desirable incentives. Perhaps appeal to competitive motives might also be made through the giving of rewards to the best or most rapid workers, the method of the bonus, etc., although these are forms of incentive that experience in other fields of education convinces us should be applied sparingly.

6. Another principle of method has to do with the recognition at all stages of vocational education of the three fundamental divisions already indicated — namely, that of practical participation, that of mastery of related technical knowledge, and that of social insight. In general, it may be held that the proportion of time given by the vocational school as such (that is, apart from participation in productive work for its own sake under commercial conditions) should be chiefly to practice work at the outset, with a gradually increasing emphasis upon technical knowledge as the student builds up a basis of practice for purposes of interpretation. As the student grows to greater maturity and experience increasing emphasis should be placed upon the third division of social insight.

7. Experience seems to indicate that another important principle of method to be applied as far as practicable in the case of beginners is that of organizing nearly all teaching

units, especially in so far as these are concerned with practical work, on what is known as the project basis. The great advantage of the organization of teaching units on the project basis is to be found in the pupil's own clear comprehension, from the outset, of the particular goal of achievement, proximate though it may be, to which he may address himself. A subsequent section of this chapter is devoted to analysis of the project method. (See also discussions in chapters on Agricultural, Industrial and Homemaking Education.)

Factors in Vocational Competency. — The competency of the successful worker in almost any calling is a resultant of several factors or components, each of which is to a degree capable of independent analysis. Some of these are purely hereditary in character — such as the types of physical strength, quickness of reaction, powers of endurance and various temperamental feeling and intellectual qualities, as to which men differ greatly among themselves. Some of these qualities are due to the character of the nurture provided in early life — the food, shelter, rest, play, and social stimuli which determine whether growth shall be good or bad, complete or incomplete. Doubtless, too, some of the factors making for the success of the worker receive their character from these portions of his school, and extra-school, education which had been obtained quite without specific reference to a possible vocation.

But leaving all these aside for the time, we can profitably consider those sets of factors into which the productive power of any good individual worker may be analyzed which are primarily the results of his vocational experience, training, and study — whether formal or informal, organized or unorganized, direct or indirect.

The principles of method require recognition in almost all fields of vocational education of at least three fundamental phases, namely: (*a*) the attainment of practical skill —

manipulative or managerial — and other similar results of definite experience; (*b*) the acquisition of related technical knowledge; and (*c*) the development of related physical, social and cultural insights and appreciations. A fourth stage may be involved where definite training towards leadership or powers of directing others, presents itself as a special problem, but for the present we shall include this under managerial skill.

The relation of abstract knowledge to skill in a sound scheme of pedagogy constitutes a peculiarly difficult problem for vocational education. Probably with the majority of individuals, and having in view the usual run of occupations, the best approach to the vocation, after having established certain preliminary ideals, and after having discovered an active motive for vocation mastery, should be along the lines of concrete achievement on carefully selected units of the work itself. As fast as this achievement gives a concrete basis for the acquisition of related technical knowledge that also should, in the form of some definite unit, be made a matter of attainment. Finally, with the growing consciousness of mastery and the interest in the social aspects of the manipulative or managerial — and other similar results of vocation, it is likely that extended appreciation of physical, social, and cultural aspects can be definitely developed as a series of related " B class " studies.

Correct method not only requires approach through achievement, but also in as many cases as practicable, the learner's own enjoyment of the results of that achievement as found best in convictions of workman's standards reached and secondarily in enjoyment of a certain monetary profit resulting from the work itself. Sound pedagogy suggests, therefore, that wherever practicable, the learner should reap the reward of his efforts in the form of a wage, piece payment, or other valuable return. In rare instances, as in agriculture, the learner's own family may be the direct re-

cipients of the goods produced, but, even here, the fundamental economic principle should be followed of insuring to the individual definite reward of his labor.

We may readily analyze the mastery of his vocation shown by the farmer into " skills " or manual and managerial performance and technical knowledge of the ends, means and methods which will make his work successful. The house-building carpenter must possess numerous forms of special skill, as shown in his use of hand tools conspicuously, and also must have the mastery of technical knowledge which enables him to make plans, read drawings, perform calculations, estimate costs, etc. The worth of the stenographer to her employer is determined partly by her precision and speed in taking dictation and transcribing notes; and in part by her " knowledge " (as we say in ordinary speech) of spelling, punctuation, and the technical terminology peculiar to her employer's calling, including even facts of geography or history. Any one of us can, in a measure, disentangle in the skein representing the total competency of routine performance, the respective elements of skill and technical knowledge (or something closely corresponding to them), in surgeons, nurses, cooks, primary grade teachers, horse-shoers, plumbers, tailors, machinists, automobile repairers, ship captains, grocery-store clerks, locomotive engineers, coal mining operatives, telegraph messenger boys, and poultry raisers. The distinctions here drawn, it must be observed — as *e.g.* between the stenographer's " skill " in shorthand and her " technical knowledge " of spelling — may not be fundamental or important distinctions psychologically, but they are of great importance in determining educational procedures, as will be shown later.

Analysis of the hundreds of vocations followed by men and women seems to show that the relative amounts of technical knowledge and skill essential to optimum performance vary greatly. The deck laborer, the coal passer, the min-

ing " mucker " and so-called unskilled physical workers generally, find their services valued largely in proportion to their specialized, and often easily acquired skill in using their exceptional physical strength and endurance. Similarly, the cigarette maker, the chambermaid, the spinner, and fruit-picker and the numberless workers on specialized processes in factory operations seem to be paid chiefly for the skill that expresses itself in detailed forms of speed and accuracy. The amounts of what may properly be called technical knowledge required or desirable, in the case of these workers, seems very small indeed. On the other hand, one thinks of accountants, field salesmen, surveyors, electrical workers, teachers, army officers, pharmacists, reporters, printers, actors and perhaps housewives and farmers, as possessing relatively great needs of technical knowledge as compared with what is sometimes half contemptuously called — especially by schoolmen — " mere skill."

II

Skill in the " Arts." — To the reader informed as to the evolution of productive processes it will already have occurred that at least some of the distinctions here discussed depend upon the stage of advancement reached by the field of work itself. The industrial arts, as they have long been called, possessed a large " content " to be acquired only by practical experience, long before the technical knowledge possible to them had been as it were detached or disentangled. Such operations as cooking, tanning, tempering of steel, making of cigars, extracting teeth, making garments, teaching children, gardening, and the like, were highly developed as " practical arts " long before the " technical knowledge " interpreting the practice was understood. Men produced harmonies by aid of voice and instrument long before the scientific facts of musical harmony were understood. Probably the " arts of healing " rendered some

valuable service to mankind long before there was a science of medicine. The gardening of China is to-day one of the most productive forms of tillage in the world; but the Chinese have as yet no agricultural science. In these practical arts there is involved, of course, "knowledge" and that, often, very involved and extensive. It is transmitted by the intimate processes of apprenticeship, as a part of the "tricks of the trade" and to the external observer at least it appears to be an integral part of the skill of the worker. In the fullest sense of the term as used here, *technical* stands rather for those elements that have been segregated out, put in print, or given graphic representation; but the distinction should not be pushed too far.

The practical bearings of the present discussion appear when we study the evolution of schools of vocational education and the problems confronting us in America when we try to increase the variety, extend the range, and improve the effectiveness of vocational schools. A survey of this evolution discloses three fundamental facts: (*a*) the age-old and approved method of teaching *practical skill* in vocation is through actual participation in the work being done, such participation when organized and regulated being called apprenticeship; (*b*) when, in any vocation, a body of somewhat detached or separately organized technical knowledge (including special forms of skill) has been created in or about a given vocation, the methods of apprenticeship or unorganized participation are ineffective in securing needed mastery of this technical knowledge; and (*c*) it is recognition of this fact that gives rise to demands for special classes or schools which shall insure acquisition of this knowledge or necessary special skill.

Vocational Schools to Supplement Apprenticeship. — To a large extent, therefore, the earlier schools that deserve to be called vocational (more correctly to be designated as technical schools) were established for persons already in or com-

pleting an apprenticeship. In America as early as 1840 there had been founded in our larger cities "Mechanics' Institutes," the primary purposes of which seem to have been to provide facilities for the technical instruction of those who had completed their apprenticeship. These Institutes, often endowed by philanthropists, were planned to contain libraries of technical books and drawings and even exhibits of new machines and products. Under them were organized evening classes in drawing, science, mathematics, etc., for advanced apprentices or journeymen.

It is well known that the system of continuation schools found in Germany had its origin largely in the attempts, sometimes of organized masters or employers, sometimes of journeymen or workers, to provide needed education, general or vocational, beyond that practicable under the conditions of apprenticeship. As far as possible these schools were at first conducted outside of the working hours claimed by the person or employment to which the youth was apprenticed — on Sundays, in the evenings, during slack seasons, etc. But none of these expedients sufficed to insure needed definiteness or continuity of training; hence the legislation, first usually enacted in the smaller states, prescribing a minimum number of hours per week for a stated number of weeks per year during which the worker must attend a duly approved continuation school.

The earlier colleges of medicine and law seem to have been largely devised for apprentices. Their courses consisted chiefly of lectures given by the best known practitioners or specialists of the community. The "teacher-training" colleges of England were for years open only to those who had served an apprenticeship as "pupil-teachers." Perhaps the most successful work done by the agricultural colleges of America (when judged by the combined standards of economy of cost and effectiveness of result) has been the "short course" instruction offered in the college itself, and

the "extension" instruction carried to the farms. The effectiveness of its instruction is due largely to the fact that a large amount of practical experience has already been acquired by the learner (he had served an apprenticeship in the University of Hard Knocks, he would say). The correspondence school which now so greatly exploits the credulity of the poorly informed achieves successful results in some cases when its courses are taken by persons already having successful experience of a practical character.

In fact, the conception that those elements of vocational competency that we call skill of performance (including many more or less intangible elements which we ascribe to "experience" only) could be taught by, or under the direction of, a vocational school is very modern. A "school" could teach facts as these were capable of definite formulation in printed matter, written problem, or graphic representation. It could teach the "principles" of the vocation (a form of pedagogic camouflage very dear to the schoolmaster type of mind, and in the case of some few students, quite successful). Even yet the large majority of engineering schools, business schools, agricultural colleges and schools, departments for the "preparation" of secondary school teachers, home economics classes, and industrial "technical schools" (technical high schools, schools of mechanic arts, etc.) make it their primary aim to teach the "principles" and other more or less abstract facts or forms of special skill that lend themselves to the teaching powers of men working chiefly with and through books, blackboards, drawing paper and the like, the abstract methods of approach being rendered somewhat more concrete during recent years by adjuncts of laboratory, studio, experimental "flats," imitations of "office practice," and gardening "plots."

Pre-apprenticeship. — Where vocational education for organized trades giving apprenticeship does not appear to be feasible the suggestion naturally arises as to why a so-called

vocational school should not undertake certain pre-apprenticeship training which will almost inevitably be along technical rather than practical lines. The writer is unable to see why, where apprenticeship is well organized, any school vocational education should be required under the head of pre-apprenticeship. It would be very much better that the learner should formally enter upon his apprenticeship, after which the vocational school should supplement by giving opportunities for extension teaching.

There is very much needed at the present time, an analysis of all of those industrial pursuits for which apprenticeship is still a possibility. It will be found, probably, that not only is apprenticeship declining in the main, but that the very conditions which even yet make apprenticeship learning a possibility in some cases are themselves changing.

It now appears probable that intensive short course work will serve the needs of a vastly greater number of workers in industry and commerce than can ever profit from systematic apprenticeship teaching, at least if modern industry continues to evolve in accordance with current tendencies.

A somewhat illusory objective often urged in connection with so-called pre-apprenticeship training is that of holding the pupils longer in school. Elsewhere, the writer has indicated his conviction that this is not a worthy objective in and of itself, and that pupils should be urged to stay in school beyond the compulsory period only in case it is evident that the school has something of substantial profit to offer them. It will be found in many cases, that the period of prolonged attendance, especially on the part of pupils somewhat retarded, becomes a period of semi-idleness in which habits of inattention and half-hearted work are not even offset by vigorous play or other spontaneous activity.

But it is highly desirable that throughout the junior high school period offerings of vigorous practical arts work, not designed necessarily to utilize a vocational motive or to pro-

duce anything more than a very moderate degree of vocational guidance should be available.

Basic Vocational Education. — Our conceptions of the pedagogy of vocational education recently have widened sufficiently to admit the possibility of giving under some form of school conditions, or at least control, the "training" that, supplementing technical instruction, gives finally the completely equipped worker. Numerous examples will occur to the well-informed reader. The best medical colleges provide the facilities, and encourage the "technically" equipped graduate to take one or more years of practice in clinic and other hospital service. Cincinnati University, in several lines of professional vocational education, develops a "part time" plan whereby the learner, early in the course, shall, under the guidance of his school, participate in "actual" work, perhaps productive work for wages. The more progressive engineering colleges require that their students shall give up one or more vacations to practical work. Schools for the training of teachers for kindergarten and primary schools require the equivalent of three to six months' "practice training." Schools training stenographers lay increasing stress on results in the shape of the speed and accuracy actually demanded in business practice. With very few exceptions the foremost exponents of vocational education for any given calling are seeking to improve the means whereby the practical training or its equivalent required to produce positive skill can be provided. It can correctly be said that the essentials of the twentieth century movement in America for the extension and improvement of vocational education are found in the demands and expectations that this training shall be "practical"— that is, shall give in largest practicable measure the skills and other results which have heretofore been available only from actual participation, systematized or unsystematized, in wage-earning or other productive work.

The sources of these demands and expectations have been, clearly, twofold. (*a*) Participation in the economic sense in productive work, and with only secondary reference to educational outcome, has been falling manifestly, even when highly organized under conditions of apprenticeship, to keep pace with the requirements of the age. One does not now expect the prospective physician, lawyer, architect or, even in England, the elementary school teacher, to serve an apprenticeship prior to professional study. No business man now expects to undertake the initial training of the stenographer or accountant, and he is increasingly reluctant to do it in the case of the file clerk, sales woman, and specialized bookkeeper. In proportion as farming, stockraising, homemaking, traveling salesmanship, secondary school teaching, and numberless other callings develop beyond the stage of being simple "arts" to be learned by simply beginning to work with or under the somewhat distant direction of other workers — in that proportion does the need of specialized schools which can teach "practice as well as theory" become apparent. In the case of the industrial callings, in many of which a well organized apprenticeship once existed, it has become commonplace knowledge that the evolution of factory production has been accompanied by a steady impairment of all the essential features of apprenticeship.

(*b*) The second substantial reason for modern interest in more comprehensive vocational education is found in the broadening conceptions of possible pedagogical means and methods. The older type of educator associated all important education with reading and writing. The educational reformers even of centuries ago inveighed in vain against purely abstract teaching but their striving to teach in part by the use of "objects" met little support. The laboratory as an adjunct in teaching science developed in the face of much opposition long after "science subjects" had been grudgingly admitted into curriculums of general education (when

nicely compacted into well-bound texts). Progressive primary teachers heard with approval decades ago the injunction " have children learn to do by doing," but the seed long fell on stony ground in spite of the lip approval often given. Hence it was necessarily long before the idea could be accepted that entire realms of possible " school " education might lie wholly outside of and beyond the immediate regions of lectures, books, pens and paper, drawing on blackboard and cardboard, and even laboratory instruction itself.

Of course, we are far from being free from the traditions here yet. The school as we have had it for five hundred years or more has derived its pedagogical procedures chiefly from the methods essential to the teaching of the reading and writing of language. Hence the chief and often the only tools which schools knew how to use were printed materials and means of writing. Many curious results persist to this day. We have hardly any substantial pedagogy for the teaching of a foreign language that does not start with the printed page and writing materials. The kindergarten effected a great break with tradition, the good effects of which are felt in the primary schools of to-day. The use of the laboratory as an adjunct in teaching science was also an important departure, but one soon corrupted by formalisms nearly related to those it was designed to escape. There are still many among us who contend that " mere trade training " is not " education " — one wonders what are their actual conceptions of " education."

III

Types of Vocational Schools. — The essential pedagogical problems now confronting all attempts at the development of vocational education in schools involve chiefly the relations of the procedures which give, on the one hand, skill or the other results of practice, and on the other, technical knowl-

edge or special forms of skill in ancillary processes. These relationships may be classified into certain types: —

A. The most primitive form, in which both skill and so much of technical knowledge as can be picked up therewith are given under conditions of actual participation in work, unorganized and often unsupervised, as in the home or on the farm, or else organized as apprenticeship. The great bulk of vocational education still found in the world is of this order.

B. Next in order of historical development is the supplementing of apprenticeship or other learning through participation by special schools or classes to give technical knowledge including tributary special skills. Examples as noted above include: the earlier schools of medicine, law, pharmacy, dentistry, and in England, teacher training; the extension and short courses for farmers offered by the agricultural colleges; the evening classes in mechanics, drawing, etc., offered to apprentices or journeymen under the old Mechanics' Institutes, all "evening industrial" school classes organized under the first industrial school legislation (1907–1916) in Massachusetts, New Jersey, Indiana and other states giving state aid to vocational education; a great variety of extension courses given through correspondence or otherwise by private and public agencies.

C. Schools giving technical knowledge of vocations, supplemented by some laboratory practice, but leaving the student to acquire skill and the other results of experience after leaving the school, have flourished in recent years. Of this type are: the medical, law, engineering, and other professional colleges intermediate between the primitive type discussed under *B* and the very modern type noted in *D* below; normal schools, usually, before the development of practice; almost all college departments for the so-called training of secondary school teachers; technical high, or mechanic arts high schools for such of their students as

subsequently enter occupations related to those whose technical aspects have been studied in college; almost all commercial or business "colleges," schools or departments of schools; nearly all agricultural colleges and schools; nearly all existing courses in, or schools of, home economics; and many of the earlier publicly supported industrial, including some alleged trade, schools in which the so-called practical work consisted merely of exercises or half play-like attempts at practical work.

D. The fourth type emerges when the vocational school undertakes to present not merely technical knowledge, but enough of "real practices" to enable the learner to substitute the results of this practice for apprenticeship or other educative participation, either before or after taking his technical studies. The modern medical college provides extensive opportunities for clinical practice for its students ere they leave the institution. The modern normal school requires some months of "practice teaching." The real trade school not only seeks to do "practical" work, but endeavors to have it done on commercial orders, — "to meet the requirements of the market." The best agricultural schools are to-day teaching the boys "farming," through making them small farmers by means of the "home project" method carried out on a commercial scale. Engineering colleges are striving to introduce a measure of practical experience into their offerings by requiring students to devote one or more vacations to the acquisition of practical experience "in the field" before completing their work. A few schools for the initial teaching of salesmanship (not extension courses for persons already employed) require that the learner shall "work by selling" every Monday and Saturday, and throughout the entire month of December (periods when opportunities in mercantile establishments can easily be procured). Almost all forms of vocational education in very recent years have strenuously endeavored to increase

their facilities for "practical work" notwithstanding the very persistent opposition of the strongly entrenched teachers of the technical subjects. The force back of the demand for more practical work has been, of course, public opinion and expressed requirements of employing authorities who are always competing for that service which is most nearly ready to meet their needs.

E. A fifth variety of school designed to procure basic vocational training (technical knowledge plus practical experience) appears when the school, instead of attempting to maintain hospitals, shops, farms, homes, offices, or salesrooms of its own, uses for its educational purposes commercial or other "going" agencies already in existence. In fact, the "home projects" in farming, and the use of department stores in teaching girls salesmanship included under *D* above are somewhat of this order. The best known examples are the "part-time" experiments in Fitchburg, Cincinnati, Beverly, and other places. Where continuation school attendance is obligatory some devices have been evolved which belong properly under this class. A few colleges send their advanced or graduate students to serve as apprentice teachers under the direction of the training institution, in the surrounding schools.

For each of the foregoing types of vocational schools, doubtless, fundamental methods of organizing and conducting instruction and training of particular kinds will have to be evolved. But, as has been noted before, back of all problems of vocational education lie certain fundamental problems growing out of the economic changes which, long persistent, increase now at a geometrical rate of speed. Few writers on education have as yet given adequate attention to modern conditions which tend to increase regimentation of production.

Types of Vocational Education. — The simplest types of teaching in vocational education, are, of course, to be found

when the elder worker, or more skilled worker, shows the younger or less skilled. At bottom there exists in all persons in some degree genuine instincts of teaching, — otherwise to be described as instincts of showing, leading, helping, suggesting, instigating, directing, controlling, governing, organizing, commanding, etc. On the other hand, under the right social stimulus, there doubtless also appear always the "learning" instincts — instincts of following, imitating, yielding, inquiring, submitting to authority, desire to be shown, etc. The operation of these social instincts can be seen on any playground, in any school, shop, or other theater of social activity.

The most complicated types of vocational teaching are to be found in large schools of vocational training where teaching functions are highly subdivided, — where, for example, one teacher, who, perhaps, has never practiced the vocation itself, imparts certain technical knowledge, another directs certain experimental work, and still a third supervises initial efforts at practice. Subdivision of vocational teaching of this character can now be seen in normal schools, agricultural colleges, medical colleges, schools of navigation, and the like. In not a few commercial departments of high schools, one teacher takes charge of stenography, another of typewriting, a third of commercial law, a fourth of English. A few of the larger trade schools exhibit similar tendencies.

An intermediate stage is found where one teacher or type of teacher is responsible for "practice" and another for so-called "theory" or the "related technical subjects." In a few cases of half developed vocational schools, a teacher of "manual exercises" has been found, who is not himself a master of the trade being taught, but who could teach on a manual training basis, some of the manual training activities involved in it.

There are good grounds for believing that an ideal vocational education, at least for the non-professional occupa-

tions, can best be given by one person who is at once master of its practical phases and at the same time intimately acquainted with its technical aspects and who, with these powers combines a large vision as to the possibilities of the right exercise of the calling, to affect for the better, society and the personality of the worker. If we could find a worker with this equipment who is also a gifted teacher, beginners, at any rate, would, under his direction, probably grow faster in vocational competency than in any other way. Some successful experiments in agricultural education have been executed on this basis (based upon the "home project," the pupils putting in something over half their time on these home projects, visited by the teacher).

But there is little indication that this method of vocational education will prove successful except in those two classes of callings which in many respects are still in elemental or primitive stages of evolution, — namely, farming and homemaking. The same method should be capable of application in many monotechnic industrial occupations (specialized machine processes or subdivisions of trades), but teachers equal to the responsibilities of this position are hardly yet available.

It is highly probable that in most forms of vocational education, teaching processes will be specialized and even that others than teachers will be required for special phases — business agents to take charge of the administration of work, coördinators to arrange for and supervise, on behalf of the school, pupils assigned to part time productive work in shops, etc. Probably developments in this direction can best be considered by taking the different classes of vocations successively.

Vocational Education for Specialized Pursuits. — It has everywhere and always been the tendency for men advancing in economic power to specialize their vocational pursuits. This tendency is furthered by all exploration, invention, use

of capital, improvements in transportation, demands for superior service, and the employment of regimental organization in production.

We find early developments of territorial specialization of production. Furs came from one quarter of the world, spices from another, silks from a third. Complicated systems of exchange of commodities early appeared in the efforts of men to obtain from the regions producing them respectively precious metals, tin, copper, iron, wines, and dyestuffs. Later, the production of woolen goods, whale oil, dried fish, leather goods, jewelry, and other art products in localized communities laid the foundations for specialized production and commerce of the middle and later centuries.

The application of steam power to manufacture and transportation has enormously increased the processes of territorial and personal specialization of production. Certain areas and populations of the world are now engaged chiefly in manufacture; others in trade and commerce; others in fisheries; others in production of temperate zone food products; and still others, in growing tropical products for food or manufacture.

The invention of machinery has been one large contributing factor to this process of specialization. Improvements of rail and water transportation have been essential to the development of any considerable territorial specialization of production. Power using tools have made necessary large use of capital in production, thus causing each type of industrial production to enlarge its units and, frequently, to aggregate these in specialized communities — *e.g.* cotton products in Manchester, edge tools in Sheffield, firearms in Connecticut, pottery in the Ohio Valley, meat packing in Chicago and St. Louis, etc.

Agriculture tends always towards specialization. Frontiersmen live by hunting and trapping; their immediate suc-

cessors support themselves by lumbering in some regions and by stockraising in others. Tillage, often miscellaneous at first, gradually settles down along the lines of production most adapted to the locality — cotton in the Southern states, wheat in the northwest, fruit in California, cotton in the Southern states, coffee in Brazil, bananas in Costa Rica, wine in Italy and France. Experience and scientific inquiry reveal the desirability of "complementary" farming — corn and hogs, beets and cattle — in individual units, for maximum use of either land or labor, and also of rotation of crops for soil conservation. Concerted social action may prevent overspecialization on one type production — *e.g.* cotton in Southern states — and so tend to promote an "optimum" diversification. But however far this may go, it is clear that the future will see steady increase in specialized producers from the soil.

In commerce and manufacture there seem to be no limits to specialization of individual workers as regimentation develops and mechanism is perfected. The application of power has tended to make of the worker a "machine tender" as one can say disparagingly, or a "machine user" or controller if one thinks of the increased control of production resulting. The driver of a locomotive, the pilot or captain of a ship, the typewriter, the loom operator, the hoisting mine engineer, the gunner firing a modern cannon, the wireless operator, the street car motorman, the farmer driving a harvester, the drill press operative and the book pressman all have this in common — each controls many and involved processes through complicated and costly machinery and in every case the enlargement of working units and the perfection of devices tends to simplify his work and to enable him to give his fullest attention to the immediate service he is employed to render.

The degree of native and of acquired intelligence called for in each case as well as capacity to take responsibility

necessarily varies. We think of any man or woman — but not a child — as being capable of caring for, and using, a watch, a cookstove, or a sewing machine. We look with more solicitude after the qualifications of one offering to drive an automobile, a team and mowing machine, a steam drill, a planer, a street car, an office-building elevator, or a loom. Only to exceptional men do we entrust the navigation of a ship, the drawing of an express passenger train, the boring of large cannon, the operation of a newspaper printing press, or the rolling of heavy plates. But wherever we can simplify the work of the machine director, make his tools "fool proof," diminish the element of the "personal equation," we do so — and our action in that direction accords with the best efforts of civilized society to transfer, first to beasts of burden, and then to inanimate forces, the drudgery of production. It may be that sometimes we keep the young worker too long with one tool, that a certain amount of shifting would give a better "physical and intellectual development from work," and that our means of finding the maximum use for the abilities of any one individual are not yet at all what they should be. But these constitute problems of adjustment, not to be solved by the restoration of the conditions of hard production formerly prevailing.

It would not be wholly illogical to assume the existence of a fundamental social tendency towards such harnessing of natural forces that eventually man would be called upon to perform no drudgery. This has long been the dream of toil worn humanity when it should arrive at the land flowing with milk and honey, the New Jerusalem beyond the grave where none need work, and where each artistic soul "in his separate star shall paint the thing as he sees it, for the God of things as they are."

But for the present we cannot escape the conviction that man's increasing wants tend at least to keep pace with his increasing productivity, and that therefore the development

of greater earning power (in terms of want-supplying commodities) does not lead to diminution of effort. This is especially seen among prosperous farmers, middle class professional men, and operators with moderate amounts of capital everywhere. The effects of specialized production upon the probable needs for, and character of, vocational education are referred to elsewhere. What the effects will be on methods of training and instruction it is too early to predict. In many cases it will greatly increase the needs and requirements of managerial education. For others it creates acute needs for specialized training in skill, and especially for situations involving combinations of speed and skill. We are now within sight of practicable experimental investigations here.

The "Project" as a Teaching Unit. — For purposes of school-room administration, the subject matter used to realize any particular purpose in education must be broken up into subdivisions so as to form serviceable "teaching units." Broadly speaking, a subject itself is such a unit — *e.g.* history, American history, geography, French. An amount of one of these subjects suitable or convenient for a year's work (or other long period) gives us the "course" — another type of unit. We speak of a course in First-year French, Advanced Mathematics, etc. Also, for purposes of convenience, we divide courses into subdivisions of various sorts — *e.g.* the book, part, chapter (at least in the textbook), section, topic, lesson, etc. For pedagogical rather than administrative reasons, these divisions are also often broken up into sections, such as definitions, exercises, explanations, assigned readings, references, rules, questions, vocabularies, conspectuses, tables, etc.

Now the primary purpose of making all these divisions and subdivisions is, of course, some form of efficiency — efficiency of organization, of accessibility, of mastery. Usually, as in all other forms of activity, we prefer to have the

dividing lines or boundaries in educational subject-matter fall where nature itself or the work of man has created channels, cleavages, or natural classifications. But if this cannot be done, we create purely arbitrary divisions. To use comparable situations in other fields, we find that a grain of wheat, a natural subdivision of "wheat," is too small for practicable handling, but a "field" of wheat too large. Hence we arbitrarily subdivide into bushels, centals, or "sacks" where "manhandling" is necessary. But in rendering a beef portable we first naturally "quarter" it, and these we again divide, partly along natural lines. For ease of ascent we break a steep slope up into "steps" and we also often create larger divisions by landings.

Sometimes we find we have pushed the subdividing process too far or in wrong directions. We are trying to blend elementary algebra and geometry, botany and zoölogy, etc. Or we subdivide what before was merged — *e.g.* physical geography and commercial geography, English language and English literature, etc. We have given up the old catechetical unit — the question and the answer; and in such subjects as geography and history, the lesson (which was usually based on one day's working energy of the child in a stated subject, and hence could rarely be a "natural" unit) has largely disappeared. It can still be retained in reading and "language lessons" because these consist largely of exercises which can be cut off at any point suggested by the limitations of energy on the part of the learner.

The importance of having good teaching units in education is no less than is the importance of having good working subdivisions of time, matter, force, distance, difficulty, etc., in practical activities elsewhere.

In packing goods we devise packages adapted to, or controlled by, the conditions to be met. A box or small crate of cantaloupes may be very light for a man to carry, but a larger box would result in damage to the melons. But

these small boxes can be crated for handling by trucks. Wheat is sacked in bags adapted to a strong man who must "use no hooks"; while fabrics can be boxed in packages that no man can lift because truck handling with hooks is practicable. The size of a newspaper, the weight of a volume, the length of a sermon, the duration of a call, the size of a "portion" of food, the height of a table, the width of a farm, the length of a day's work, the height of a room — all these units or divisions are the resultants of certain natural conditions working in greater or less opposition to man's forces and necessities. They all represent compromises, gravitating towards optimum standards.

Varieties of Teaching Units. — But in the organization of the "means" of education — the studies, lectures, "tellings," discussions, experiments, exercises, assigned readings, memorizings, reports, activities, problems, trials, tests, examinations, etc., through which we achieve our desired ends — we have given, as yet, insufficient attention to the organization of effective teaching units of the smaller kind — those that would be especially significant to the learner. The "question and answer" unit — as seen at its best in the catechism — was the smallest unit ever devised. It was in part definitely pedagogical and in part definitely logical. It was eminently suited to an age in which authority was the source of all knowledge for the learner, and verbal memorization the chief means of fixing in the minds of each new generation the dogmas and other authoritative teachings of the older generation. This unit had also the peculiar advantage of being most easily handled by unskilled and uninformed teachers.

The "lesson" unit was in part a pedagogical unit — that is, based upon the powers and weaknesses of learners — rather than a logical unit — that is, based upon the inherent characteristics of subject matter. It was, of course, not a true pedagogical unit — that is, taking account of all of the

characteristics to be found in the child as active learner; it might be called a unit based roughly upon the capacity of the learner to give attention, to endure application, or to give working time. It was, in other words, a convenient task, a sort of day's work, so far as a particular kind of activity was concerned. It was often an arbitrarily sliced-off portion of subject matter, and represented frequently no logical division of that subject matter at all — resembling, therefore, as a unit, a stated length of board or cloth, or a slice of bread rather than tree trunk, a garment or a biscuit.

The "topic" which in many studies succeeded the lesson as the teaching unit of chief importance was especially characterized by its logical relation to some larger unit or "whole" of subject matter, while at the same time it was endeavored in it to take account of the possible focusing of interests and the intellectual "spanning powers" of young learners. In many respects it was therefore an advance upon units previously developed. It lent itself especially well to teaching in which some reasoning, inference, and comparison on the part of the learner was sought in lieu of the verbal memorizing which had formerly prevailed.

A few years ago some of us began using the word "project" to describe a unit of educative work in which the most prominent feature was some form of positive and concrete achievement. The baking of a loaf of bread, the making of a shirtwaist, the raising of a bushel of corn, the making of a table, the installation of an electric bell outfit — all these, when so undertaken by learners and handled by teachers as to result in a large acquisition of knowledge and experience, were called projects. Projects of this kind might be individual or joint (coöperative). They might be executed in an ordinary lesson period or they might claim the efforts of the learner for one or more hours per day for several weeks.

The following were the primary characteristics of projects as thus conceived: (*a*) the undertaking always pos-

sessed a certain unity; (*b*) the learner himself clearly conceived the practical end or outcome to be attained, and it was always expected that this outcome was full of interest to him, luring him on, as to a definite goal to be won; (*c*) the standards of achievement were clearly objective — so much so that the learner and his fellows could, in large part, render valuable decisions as to the work — in an amateur or in a commercial sense — of the product; and (*d*) the undertaking was of such a nature that the learner, in achieving his desired ends, would necessarily have to apply much of his previous knowledge and experience — perhaps heretofore not consciously held as usable in this way (*e.g.* art, science, mathematics, special tool skill) — and probably would have to acquire also some new knowledges and skills.

As in many other forms of learning, the objectives held in view by learner and teacher were often unlike. What the learner imagined as an end the teacher conceived often as a means to some remoter end.

The Project in Vocational Education. — In the early stages of the development of certain forms of agricultural and industrial vocational education, a number of educators favored the project as the chief pedagogic unit of organization. In a sense any concrete job undertaken in a vocational school where the realization of valuable results in product constitutes an important end, might be called a "project"; but to be an "educational project" such a job, *e.g.* turning a spindle, wiring a room, growing a half acre of potatoes, taking commercial charge of three cows for a year, cooking family breakfasts for a month, making ten saleable shirtwaists, coöperatively building and selling a cottage, etc., must be of such a nature as to offer large opportunity, not only for the acquisition of new skill and experience in practical manipulation, but also for application of old, and learning of new, "related knowledge" — art, sci-

ence, mathematics, administration, hygiene, social science, etc.

The alternatives to the project as a teaching unit in vocational education are several, nearly all of which are exemplified in any commercial school. They include: (*a*) the "practical exercise," the processes of which resemble in many respects the actual processes of the practical world, *e.g.* typewriting, stenographic drill, bookkeeping exercises, but which give no marketable or otherwise usable product; (*b*) technical subjects, organized topically, but commonly not definitely related to practical exercises then being considered, *e.g.* commercial arithmetic, business English; (*c*) joint enterprises of practical but nonproductive character, *e.g.* commercial school banks, or offices; and (*d*) jobs on a "gang" basis, largely for the commercially profitable ends of the institutions (not found in commercial schools, but often characteristic of the "practical" agricultural school with a large farm, and of institutions, as seen in chair caning, tailoring, gardening, dish-washing, etc.).

In industrial schools the alternatives to the project chiefly found are: (*a*) the practical job contributing towards building equipment or resulting in gifts to the learner; (*b*) the exercise; and (*c*) the series of technical lessons. But these are seldom related, whereas in the "project" it is expected to integrate them all.

About the same time that the word "project" came into popular use in discussions of vocational education, it was also becoming popular in writing on manual training. The systems of sloyd had taught "processes" largely, using "exercises" for this purpose. In each case any given item of practical work was conceived of as belonging to a very definite and logical series cumulative towards some general form of organized knowledge or skill. The "model" was, apparently, more "integral" than the exercise as a stage in a "process," but it did not meet all the pedagogic needs later expressed in the practical arts "project."

In practical arts (as distinguished from vocational education) the project was expected to give an integrated outcome and one which appealed to the child's sense of the "worth-while." Hence the logical sequence of a series of projects might be hard to find, whereas, presumably, their pedagogic appeal to interests was manifest. By 1912 the project as a pedagogic unit of organization in practical arts and in vocational education had found a place, if not always a welcome.

Then arose interest in the more effective teaching of science. In science teaching the "experiment" (which was in reality more often simply a directed exercise) corresponded to the "model" and "exercise" in the practical side of manual training. Logical considerations inherent in the subject matter of science gave rise to the so-called "logical order" (another name for the organization which seems most economical and effective to the specially informed and mature adult) which had always dominated in the selection and serial disposition of exercises and abstract studies of school science. Pedagogical organization (another term for the selection of matter and arrangement of steps making the subject most accessible to uninformed and youthful learners, with their childish motives, powers and frailties) had been largely ignored. But when a new start was attempted under the flag of "general science" it was found that a few units of the proposed rearrangements of the materials of science could be described properly as projects.

For example, if a group of pupils set out to make some photographs with school or borrowed equipment (clearly a project) it is possible to seize the interest and opportunity thus created to give a considerable amount of new knowledge (facts, interpretations), regarding the formation of the image, the use of the lens in adding to the light making the image, the chemistry of light action on certain compounds, the chemical significance of developing, etc. Similarly if

a group of pupils set out to grow some plants under controlled conditions in the schoolroom, it is readily to be seen that this project gives varied opportunities to extend their comprehension of scientific facts and principles. Other projects of a similarly useful and informing nature are now seen to be practicable: to exterminate flies in the schoolhouse; to purify the water supply; to correct smoky lamps; to improve the time-keeping quality of a pendulum clock; to arrange soil conditions for tree planting of the grounds; to improve a school-bell system; to cleanse spotted clothing; to ascertain the wholesomeness of the home milk supply; to prevent breeding of mosquitoes; to set up a home call-bell system; to keep the teeth clean; to improve the home processes of making biscuits; and a thousand others of similar nature.

We find, however, that the term "project" is hardly elastic enough to cover all the types of units of instruction which might well be organized under the head of general science. We might want our pupils to obtain some information as to comets; can we devise what can legitimately be called a project for this purpose? Of course we can call an enterprise destined to give the pupils more knowledge of comets (using books, pictures, and, perhaps, if circumstances favor, some naked-eye observations and a peek through a telescope) a project in learning; but this simply stretches our useful term to unmanageable and unserviceable dimensions. We do not forget that Webster defines project as: "that which is projected or designed; something intended or devised; a scheme, design or plan."

Nevertheless it is to be hoped that we could give to the educational project a limited and definite meaning which would make it the designation of a useful type of teaching (or learning) unit, distinct from the lesson, the exercise, the topic, the experiment, the reading assignment, the inquiry, the investigation, etc.

Perhaps it would be well to introduce modifiers to designate different grades or classes of projects. Recently, when coöperating with a committee preparing a manual on household arts, wherein it was desired to set forth as much of the work as possible on a project basis, it early became clear that in the divisions relating to the preparation and serving of food, and the making and repair of clothing, it was easy to find many projects suited to the ages and conditions of the pupils (girls 12-16) planned for. But in the divisions relating to the care of children (nursing) and the choice and equipment of the home (housing) it was difficult, if not impossible, to find suitable projects as these are ordinarily conceived. To meet the difficulty a new type of project was planned, called an "Observation and Report Project," to apply in nursing and housing. For example, a girl would undertake to survey a given house and study its location, yard, drainage, water supply, exposure to light, cold, etc., and make a report, with drawings, etc., thereon. Similar possible projects as to nursing were described.

All these projects were divided into the following classes: Execution projects (school); execution projects (home and school); and observation and report projects. In addition, other learning units involving chiefly book study, were described — *e.g.* "telling" by teacher, exercises and school experimentation (calling them all topics), and of these topics, several kinds were distinguished.

The Project as Correlation Center. — It is well known to all vocational school teachers that endless difficulties are encountered in trying to "correlate" technical courses of instruction and practical work. The practical work necessarily requires its special organization, owing to gradation in difficulty of stages, etc. But the "related" courses — mathematics, drawing, chemistry, sketching, English language, foreign language, geography, etc., according to the vocation in view — have all their own "logical" organ-

izations which cannot, apparently, be disregarded. The mind of the pupil therefore is divided and follows to the end different tracks of learning which do not intersect.

In the " project method," the unit of productive or quasi-productive work becomes the correlation center. The logical order of " related subjects " is necessarily broken up. Units from the related subjects, where naturally connected with the projects, are used. Special units of instruction and even training thus become easily developed.

At first, naturally, the method appears relatively cumbersome and wasteful; but in large measure this appearance may be due to persistent illusions as to the fruitfulness of method of formal instruction and training in related science. The academic mind especially is easily deceived into thinking that a pupil's glib mastery of textbook and laboratory chemistry will " function " when he becomes a farmer or that a school girl's excellent reciting abilities in physics will constitute an asset in her work of homemaking.

Furthermore, we have as yet few acceptable precedents for good vocational projects. We can easily supply productive jobs in vocational education; but the truly " educational job " — the project — that possesses " root " connections with all naturally related fields of knowledge and ancillary skills has usually to be invented. For this work originating powers of a very high order are required, as well as conviction that profitable educational undertakings are to be developed in this direction — a combination not yet often found among educators.

IV

Problems of Method. — In no field are there more genuine " problems " of method than in that of vocational education. To what extent do the effects of specific training extend or transfer? To what extent can we " borrow " motive?

Can vocational education be made to produce incidental "moral values" of general importance?

Effects of the Theory of Formal Discipline. — In the field of vocational education no less than in the fields of moral and cultural education the theory of formal discipline has played a large part. Nearly all adults who have given no careful study to the questions believe yet that it is possible to teach "observation," to train in "concentration," to produce "mechanical ingenuity." Common experience teaches us, of course, that we can, by training or instruction, produce endless *specific* powers; but can we, by teaching certain specific powers very fully, and carefully, produce general powers?

Suppose a boy is taught to be very accurate in driving nails, or in using a hand-saw in making small building parts; will he be found more accurate as a consequence in laying bricks or in soldering tinware? The question is not simple, and psychological experiments to date do not give wholly decisive answers. Obviously what the boy does in bricklaying or tinsmithing will depend not only on the skills and knowledge which he brings, but upon his desires, his appreciations, his ideals. It may be that when he began wood working he had little interest in accurate work. As a result of his first work in carpentry he develops either a fear of the consequences of turning in bad work, or a pride in work that is commended. He may bring to tinsmithing no skills, but he may bring desires, which will enable him to learn faster.

All recent studies seem to indicate, however, that parents, educators and employers tend to expect too much from the possible "transfer" of training. It is endlessly argued that study of plane geometry develops "reasoning powers," that study of Latin or botany teaches "observation," that mental arithmetic begets concentration, and that manual training really trains the hand, as the name implies, and also

trains the mind in exactness, accuracy, etc. It is even possible to find persons who argue that once a boy has learned to saw "squarely," his moral character thereafter will be much more "square" than it would otherwise have been. It requires only moderate experience to show that in these contentions there is some truth, probably much error, and unquestionably a great deal of confusion, due to use of ambiguous words. Of course the study of plane geometry trains in "reasoning powers" — not reasoning powers of all kinds, assuredly, but those peculiarly required for the problems of geometry. Is there such a thing as "reasoning power" in general? Or a "faculty" of reasoning? "Probably not," is the answer of modern psychology. At any rate the words are too vague and equivocal to be of service to the educator.

Nevertheless we may expect to find many consequences of the doctrine of formal discipline long persisting in the pedagogy of vocational education. For years it was believed that the specific powers acquired in manual training would "carry over" into the trades. It was contended that a learner habituated to the wood lathe would thereby acquire a stock of powers that would serve him in learning the use of any rotary machinery. At least he would have learned the "principles" — those vague abstractions so dear to the academic mind. At present it is held by many that if a young person has learned salesmanship — *e.g.* of books — he becomes thereby equipped in an important degree to be a salesman of, *e.g.*, automobiles, or in other words he has acquired the basic "principles" of salesmanship. Many of the abstract studies found in commercial courses are designed to give knowledge of principles — perhaps skill of a "general" nature in a few cases — for use in business life.

Vocational Motives. — One of the formidable problems confronting the advocates of prolonged school attendance for all children is that of stimulating active interests in, or

motives for, the work to be taken. Lately certain writers have recommended the enlistment of vocational motives. The Commission on the Reorganization of Secondary Education has gone so far as to recommend that the principal offerings of the senior high school should center in certain "broad" vocational courses. The intent of this is not so much to assure vocational education as it is to utilize vocational motives as "holding powers" for general, and especially for civic, education.

But if the interpretations of vocational education made in this book are sound it will not prove practicable to substitute for it camouflaged general education. To a large extent that has been done for years in commercial education, but here the schools had the advantage of the aspirations of the children or working people to rise to "higher" callings, the gateways to which appeared to be only the commercial schools. It is very doubtful if interest in "blended" commercial courses could be maintained, if these were in active competition with courses of genuine vocational training for the commercial callings. Manual training and technical high schools have attracted large numbers of students, not, it is probable, because of direct appeals to vocational motives, but because these schools have offered college preparatory courses and general education more attractive to certain kinds of temperament than the courses of the classical schools.

It is, therefore, greatly to be doubted whether the prolongation of interest in liberal education, for pupils of average abilities and perhaps little taste for the academic, can be affected by the sincere and effective use of vocational motives. If honest and straightforward vocational education is provided it will drive out the "blended" type. But it is the responsibility of educators so to improve their offerings of liberal education that these will not require the adventitious aid of vocational motives.

Students of human nature as well as psychologists are well aware of the existence in all normal human beings of what may well be called "workmanship" instincts. These manifest themselves universally in children whose play and games are patterned largely after productive activities; in youth who show besetting impulses to use the tools and to imitate the work of elders; and in the outcroppings of "creative" impulses among adults.

But we are still very much in the dark as to how far these instinctive tendencies alone supply motive force for modern conditions. Often they seem to rise but little above the levels characteristic of primitive social life. They seem excessively dependent upon the play spirit. Only under strong extraneous motives, often, can men and women be depended upon to "work hard," to subject themselves to painful routines, to postpone pleasurable "excursions." Everyone who has tried to assist the poor and irresponsible, to hold adolescents to systematic effort, or to organize for productive purposes the dwellers in warm climates or the primitive humans of any part of the world knows how imperfectly functional for the conditions created by crowded populations, large utilization of natural forces, and rising standards of living are the motives dependent directly upon instincts of workmanship.

But social life abounds with examples of the successful use of extraneous motives. Strong men early learned to drive their fellows to work by fear. The desire for "gain" — that is, for much-wanted consumable or capital goods — can be extensively utilized. Desire for approval (or to escape disapproval) plays a very large part in holding modern man to toil. Finally, habituation, rendering that which was unpleasant, pleasant in time, and drying up the fountains of competing incentives, makes toil welcome and even necessary. Thus civilized society makes the worker, the man of routine, the provident investor, the inventor, the power harnesser.

We know little as yet relative to the use of vocational motives in schools. With young learners we have counted too heavily upon the instincts to produce. We have seen city children from a starved environment take with avidity to tools when given opportunity and we have too readily inferred that these new-born interests were capable of holding them for a thousand hours per year no less than for a half dozen a week. We have learned that even adults, stimulated by a knowledge of their inferior earning powers, will rarely persist in "long" courses in evening schools, but that the incentive of a "short unit" course, if it be concrete and visibly related to the day's work, is sufficient to produce valuable results.

The writer is strongly of the opinion that in all schools of basic vocational education we must yet utilize the motive of gain. Only in agricultural schools now can the worker enrich himself from the proceeds of his project. It will be found that no better investment can be made than to give the learner the net money value (barring cost of instruction) of the productive work he does in learning.

Moral Values of Vocational Education. — Sound vocational education will, of course, produce the specific moral virtues characteristic of the given vocation. The specific fidelities, loyalties, thoroughnesses, and honesties, and other ideals thus produced are, of course, assets or factors in that composite of virtues, known as "good citizenship," "moral character," and the like.

But how far can we rely upon vocational education to produce virtues, that will apply outside the vocation? The world is familiar with the fact that often a conscientious workman is not a good father or voter, that a man may be the soul of honor with business associates and yet easily capable of dishonorable action towards others. Loyal soldiers are often blind to public interests. A hardworking farmer may be stingy and a monopolist.

Probably we are deceived by the fact that among adults our first and most prevalent valuations of men and women are in terms of their vocations. Has a man's law school education and his lawyer's experience given him the "virtues" of a good lawyer? We first appraise him therefor. Is a manual worker punctual, industrious, careful of tools, habituated to give conscientious workmanship? Our first valuation is that he is a good citizen generally.

Inductive study of examples of this kind will probably make clear in the first place the large part played in good citizenship by the specific vocational virtues and also the prevailing tendency of reasoning to ascribe to the approved man's education the native virtues that have in reality come into prominence as a result of selective processes. Probably the man who is so endowed by nature that he easily becomes a good workman is also similarly endowed with many of the qualities that develop into non-vocational virtues.

The entire subject needs examination. Quite possibly skillful teaching at the right moment would be able to "extend" or "transfer" into non-vocational areas, if not the habit and knowledge elements of vocational virtues then in process of formation, at least their "appreciative," "aspirational" or "idealistic elements." A boy caught in deceptive work can readily be inspired and even trained not to repeat that misdeed. Skillful teaching (the simple old moralizing, goody-goody "stuff" will not "go" with a real American boy) might then develop appreciation and ideals of very general application.

CHAPTER V

VOCATIONAL EDUCATION FOR THE AGRICULTURAL CALLINGS

I

According to the 14th U. S. Census, there were in 1910 engaged in the pursuit of agriculture in the United States a total of over 12,600,000 persons (see classifications on page 515). The variety and value of the products of farms are summarized in the following tables:

TABLE I. VALUE OF ALL CROPS, UNITED STATES, 1909

(Compiled from 14th U. S. Census, 1910)

All Crops	$5,487,000,000
Cereals	2,665,000,000
Corn	1,438,000,000
Oats	414,600,000
Wheat	657,600,000
Barley	92,458,000
Buckwheat	9,330,500
Rye	20,421,000
Kaffir corn and milo maize	10,816,000
Emmer and spelt	5,584,000
Rough rice	16,118,600
Other grains and seeds	97,576,000
Dry edible beans	21,700,000
Other beans	241,000
Dry peas	10,963,700
Peanuts	18,271,900
Flaxseed	28,900,500
Miscellaneous seeds	768,625
Grass seed	15,137,683
Flower and vegetable seed	1,411,000
Hay and forage	824,004,877
Tobacco	104,302,866
Cotton and cotton seed	824,696,200
Cotton	703,619,300
Cotton seed	121,076,900

TABLE I. VALUE OF ALL CROPS, UNITED STATES, 1909 (*Continued*)

Sugar crops	$61,600,900
Sugar beets	19,800,700
Sorghum cane	10,170,400
Sugar cane	26,405,952
Maple sugar and syrup	5,177,800
Other minor crops	18,608,000
Broom corn	5,134,434
Hemp	412,699
Hops	7,844,745
All other	595,674
Vegetables	418,110,154
Potatoes	166,423,500
Sweet potatoes and yams	35,429,000
Other vegetables	216,257,000
Fruits and nuts	222,124,216
Small fruit	29,974,480
Strawberries	17,913,900
Blackberries and dewberries	3,900,800
Raspberries and loganberries	5,130,200
Cranberries	1,755,600
All other	1,200,000
Orchard fruits	140,860,300
Apples	83,231,400
Peaches and nectarines	28,781,000
Pears	7,910,000
Plums and prunes	10,299,400
Cherries	7,200,000
Apricots	2,800,000
All other	529,400
Grapes	22,027,900
Tropical and sub-tropical fruits	24,700,000
Oranges	17,500,000
Lemons	2,900,000
Pomeloes (grapefruit)	2,060,000
Figs	803,800
Pineapples	734,000
Olives	404,400
All other	143,467
Nuts	4,447,600
Almonds	711,900
Pecans	971,596
Walnuts (Persian or English)	2,297,336
All other	466,772
Flowers and plants	34,872,300
Nursery products	21,050,822
Forest products of farms	195,306,283

TABLE II. LIVE STOCK ON FARMS

(Compiled from 14th U. S. Census for 1910)

	VALUE, 1910.
Total	$4,925,000,000
Cattle	1,499,000,000
Horses	2,083,000,000
Mules	525,000,000
Asses	13,000,000
Swine	400,000,000
Sheep	232,000,000
Goats	6,000,000
Poultry	154,000,000
Bees	10,000,000

The foregoing figures suggest the magnitude of American agricultural interests but they give no satisfactory analysis of the farming vocations as found throughout the states. From the point of view of one type of writer, farming is "just farming," and to talk of a large number and variety of specific vocations within it is almost absurd. From another point of view, however, there are scores of different vocations presenting "common principles" only in the last analysis and to the mind exceptionally capable of grasping abstract principles.

There is greatly needed, for purposes of organizing and administering vocational schools of agriculture, an extensive and concrete analysis of present degrees of specialization of the agricultural vocations, together with forecasts of probable future tendencies. The term "general farming" so freely used by not a few writers is thoroughly misleading. Quite obviously no "general farmer" in Massachusetts includes oranges, cotton or beet sugar among his products. Farmers in Mississippi do not usually produce raisin grapes, cranberries, or considerable numbers of beef cattle. In the settlement of the frontier there was once a type of general farming the aim of which, supplemented by hunting and fishing, was to produce as nearly as practicable *all* the commodities a family required. Now only the rare farmer expects to

meet fifty per cent or even twenty per cent of his cost of living from his own products. He works primarily to produce one or more marketable crops or live-stock products. The primary aim of the efficient school of agriculture must be to give competency in producing and marketing these " major " products over a series of years. Secondary to these are many other minor aims to be considered. For much interesting data consult G. F. Warren's Farm Management, Macmillan, 1914.

II

Agricultural Schools. — The primary aim of the vocational school of agriculture is therefore to produce, for a given area and given economic conditions, the successful farmer. Excluding farm laborers there are in this country probably 9,000,000 farmers. It is the most numerously followed vocation in the country, after homemaking. It may well be assumed that, in the not distant future, every man seeking success as a farmer will, at some stage of his preparation, desire the aid of a vocational school. It is not conceivable that the agricultural colleges can meet this demand, even if their primary aims were to train farmers. Agricultural colleges, with their degree requirements and facilities for research, can be expected to train large numbers of persons who will serve in some " leadership " capacity — as technical experts, managers of large farms, etc.; but to expect them to supply the training needed by the rank and file of farmers would be as reasonable as to assume that the technological institutions of the country can train the millions of trade and industrial workers required in our manufacturing and building pursuits.

If we presume that 30 years represents the average vocational " career " of the farmer it is evident that this group of callings requires not less than 300,000 recruits yearly. At

present the great majority of these do not come to their work with any direct vocational training. They have been prepared, as have their forbears for thousands of years, and as are still nearly all tillers of the soil and stock-raisers in other countries, through the by-education of practical participation as child-helper and hired worker. Organized apprenticeship for the arts of tillage and live-stock rearing has probably never existed on an extensive scale. Probably the novice was his father's assistant in so many cases that formal indenture never seemed necessary. That the agricultural arts are successfully transmitted through the by-education of unorganized apprenticeship is demonstrated by the success of these arts in China, Belgium, Mexico and hundreds of other regions which have never possessed vocational schools of agriculture. As in the trades, this by-education seems fairly successful so long as the capital employed is small, the bulk of the work is performed by hand-driven or animal-driven, rather than power-driven, tools, and there is little need for the use of scientific knowledge.

The need of vocational schools to train for the agricultural vocations has become felt only recently in America. In a vague way, probably, those persons who were responsible, even more than half a century ago, for the initiation and development of the agricultural colleges in America and other countries, thought or felt that these institutions would serve as agencies of vocational training for the actual callings of the farm. But in the majority of cases that has not happened and probably could not happen. The agricultural colleges have done several kinds of splendid service, of which the training of experts to perform experimental and advisory functions for farmers, and the offering of extension education to farmers at work have been the two of greatest importance. But in the light of our present knowledge, we can hardly expect a series of vocations, the net labor return for which rarely exceeds fifteen hundred dollars yearly, and

the modal yearly return for which, at least prior to the war, was hardly one thousand dollars, to command the kinds of ability and expensive training required to complete a college course.

Varieties of Agricultural Education. — From the standpoint of successful farming, vocational agricultural education may be considered under several distinct heads:

a. There is first the kind of education that can be given by an agricultural college requiring high school graduation as a condition for admission and giving a four year course leading to the degree of bachelor of science. This form of agricultural education is distinctly professional in its character. It presupposes students of exceptional ability and ought to qualify them for positions of expert service or leadership in some capacity.

b. Agricultural colleges have already developed extensive lines of "extension" instruction in agriculture. This work may be expected greatly to enlarge in the future. The essence of extension education is to be found in the fact that the persons taking it have already a basis of practical experience on which to build. The types of extension teaching most successful in the agricultural college consist of short courses of from one to six or twelve weeks for farmers already at work, correspondence courses along special lines, extension lectures, and demonstration and experiment station work designed to meet the immediate problems of farmers.

c. The technical school of agriculture for persons either already possessed of some practical experience in farm work, or likely to obtain such practical experience at an early date, while existing now in only a few scattered examples, probably has an important future. The "agricultural school" department found in some agricultural colleges is of this type; so also are certain schools or so-called colleges of agriculture admitting students of sixteen years of age or

upward and which are not insisting on any considerable educational prerequisite. Some county schools of agriculture and certain state institutions in New York deserve properly to be called technical schools of agriculture.

d. For boys from twelve to sixteen the "Home Project Work," related to the "Corn" and "Pig" Club work of former years, has become a widely established and generally useful form of education carried on, like scouting and other voluntary activities, in the amateur spirit. As a contribution to liberal education in the best meaning of that term this work is invaluable; but in no proper meaning of the term, probably, ought it to be called vocational, although to some it will give vocational appreciations and ideals.

e. In a great variety of high schools in the United States are found agricultural courses, based chiefly upon textbooks and some laboratory work, with occasional individual or joint projects undertaken by the pupils. These can hardly be called schools of agriculture in the vocational sense.

f. Finally, we note the vocational school of agriculture as such which undertakes to provide both for the practice and the related technical knowledge for the training of boys from fourteen to twenty years of age and within an area sufficiently small to insure a genuine mastery of vocational practice. This type of school usually proceeds through the use of a home project which becomes for the learner a project of economic importance expected to yield him perhaps not less than one hundred dollars net for a year's work. This project to be successful must be confined to some one definite field of agriculture, such as the raising of potatoes, the raising of a kitchen garden, the raising of a specified amount of poultry, the care of a specified number of dairy cows during the year, the economic management of a specified area of orchard that is taken and improved and the product marketed.

The types discussed may be analyzed in order of ages appealed to, as follows:

TYPES AND AGES	PREVIOUS PREPARATION	PRIMARY AIMS	PRIMARY MOTIVES	PRINCIPAL METHODS	EXPECTED RESULTS
Amateur home project Boys, 12–16	Any	General education	Amateur	Amateur home project	Development appreciation
Vocational home project Boys, 14–18	Any	Vocational for distinctive farm vocation	Definitely vocational	Productive home project	Practical power in vocation
Technical Men, 18–30	Grammar grade education	Practical farming	Definitely vocational	Technical instruction	Farmer-manager
Professional Men, 18–24	High school graduate	Technical mastery for technical specialization	Partly vocational, partly additional generalization	Higher and special technical instruction	Technical specialization
Extension Men, 20–50	Farm experience	Higher practical power	Effective mastery vocational specialty	Technical instruction	Improved practical power

The Home Project School. — From the point of view of the writer, the only type of *school* of agriculture that can probably succeed on an extensive scale in the future, is that described under *f* above. The reasons for this position are as follows: The economic practice of agriculture tends always towards specialization. The farmer who is making the largest financial return from his agriculture is the man who concentrates his efforts on the basis of scientific principles. This does not mean that only one crop in agriculture or one type of stock raising can give maximum economic success. In the first place, for certain areas of the country, rotation of crops must be practiced in order to insure maximum utilization of soil. In the second place, successful farming often involves complementary processes, for example, where corn and hogs, beet sugar and cattle and the like are involved. Again, under some conditions, a farmer must have two or more lines of work in the event that one should prove an economic failure, as, for example, a farmer growing wheat in a region where perhaps in only two years out of three is the rainfall sufficient to guarantee raising crops. Under these conditions, farmers must have a dry weather crop as reserve. Finally, we know that the economic practice of agriculture involves such an adjustment of lines of production as will provide for the optimum use of machinery, equipment, and especially labor, throughout the year. Subject to conditions like the foregoing, it is repeated, the economic practice of agriculture tends towards specialization. The man to succeed in any division of it must become more and more an expert in his particular field through scientific study, and furthermore, through delegating where practicable such functions as purchase of fertilizers and seeds, disposal of product, the use of expensive machinery, to special agencies designed to make the maximum use of these facilities.

The program of a vocational school of agriculture should

probably always rest on a one year basis because of the seasonal character of agriculture. A program of instruction in an agricultural vocational school should assume the availability of at least six or eight hours of the pupil's time for six days per week throughout the year. This time might then be distributed so as to give four or five hours a day on the average to practice, perhaps two hours a day to related technical studies and perhaps an hour a day to general readings and conferences expected to develop social insight, this to include class reading of some one standard descriptive text of the agricultural vocations as practiced in various parts of the world and their relation to human well-being. The vocational training of the pupil, in this as in other schools and apart from the general "social insight" course, probably will develop increasingly towards an individual instruction with only occasional conferences at which pupils and teachers will pool their common knowledge and experience.

But the program of an agricultural school must not presuppose the same distribution of time every day throughout the year. There must necessarily be two or three months during which the boy, for example, on a farm or crop project, should give his time exclusively to practice work. There will also be probably two or three months during which four, five, or six hours per day spent in the school would be sufficient. Finally, under some conditions, perhaps one or two school meetings per week, the remaining time to be given exclusively to practice on sub-projects, might be the best way of organizing instruction and practice.

It is probable that division of the teaching force according to practical work and related technical work is almost certainly destined to prove a failure. Only the man responsible for the supervision of the boy's practical work can be expected satisfactorily to take charge of his related technical instruction in that field.

It is essential that the boy should be the chief beneficiary of the net economic returns from his project. Experience has shown that a net return of $70 for a year's work for a boy 14–16 years of age should be regarded as a minimum, while ambitious and energetic boys should be able easily to earn a net return of at least $100. It goes without saying that accurate accounts must be kept with the project, so that all outlay for rent of land (and in dairy and fruit projects, interest on the capital represented by cows, fruit trees, etc.), tools, added labor in time of pressure, seed, fertilizer, and the rest should be deduced.

From time to time, questions arise as to a desirable length of vocational agricultural course. As suggested above, every program should be based on the assumption that one year's work will complete for the time being the student's requirements as to agricultural skill and knowledge in a particular project field. It should prove entirely within the possibilities of the school to offer the pupil a succession of projects even extending over four or five years if necessary. For example, a pupil might take as his first project the raising of an acre of potatoes; as his second project, the raising of one hundred head of poultry; for his third project, the raising of a field crop of corn or potatoes or hay or wheat; and as his fourth year project, the care of four or six dairy cows. This, in a sense, would represent the accumulation of several vocational possibilities.

Debatable Issues.[1] — The passage of the Smith-Hughes bill by Congress, making provision of national aid for the promotion of agricultural education of secondary grade, together with the many efforts now being made to promote agricultural production in the United States, bring into re-

[1] The following sections (pp. 154–164) are taken from an article in *School and Society* (January 19, 1918). The somewhat personal form is retained because it lends itself to definition of the issues involved.

lief many debatable issues relative to agricultural education. Already, literally thousands of ordinary elementary and high schools throughout the country are making at least pretenses of offering agricultural instruction or training; while the agricultural colleges and numerous special schools are rapidly bringing into view the various specific problems involved in making agricultural education really worth while.

Dr. Theodore H. Eaton's recently published monograph, "A Study of Organization and Method of the Course of Study in Agriculture in Secondary Schools," [1] is an important and valuable review and criticism of methods and attainments in the field of secondary agricultural education to date. In *School and Society* under the title "A Possible Core for a Program in Agricultural Education" [2] Dr. Eaton has outlined a fairly definite theory for the organization of agricultural instruction and one which manifestly deserves careful consideration.

To the man engaged in the practical problem of trying to prepare a working curriculum for an agricultural school serving a given area and a given group of students, Dr. Eaton's "core" will probably seem almost hopelessly large and complex, not to say vague and elusive. His analysis raises the question as to how far, in view of the uncertainties of educational terminologies, and the known predilections of educators for "omnibus" or "wholly" words, it is profitable or desirable for writers to attempt to "generalize" agricultural education.

Very rightly Dr. Eaton says: "There are all kinds of farmers and all kinds of farms in all kind of places." He should have added "there are many possible kinds of agricultural education adapted to many kinds of boys and men according to the ends in view or objectives to be realized."

[1] Published by Teachers College, Columbia University, New York.
[2] *School and Society*, December 29, 1917.

The greatest practical danger confronting the various states in their attempts to evolve workable schemes of agricultural education (danger, that is, of false starts, hurtful disillusionings, wasted resources and misdirected efforts of learners) will certainly come from the attempts to train boys (and men) to be "farmers" in the general sense — which is only a few steps short of that now discarded ideal of an older theory of vocational education which would train all to be "men" (which is, of course, in spite of its vagueness, a right ideal of liberal, as distinguished from vocational, education).

Now the first distinction of importance to note is the fact that sometimes the words "agricultural education" refer to a very tangible purpose in general or liberal education where the ends in view have little or nothing to do with the vocations of tillage or stock raising; and sometimes to a very different thing, namely, the instruction and training destined to prepare a person, in whole or in part, for the successful pursuit of one of the many vocations of the soil.

There is probably little need relatively for "liberal" agricultural education through schools in rural communities (especially when the regular schools provide illuminating reading that should increasingly be stimulated in upper grades), since here it comes in large measure as by-education from rural life itself. But in cities, and especially in large cities, where people are far removed from contact with rural vocations and from appreciation of the social, civic, æsthetic, intellectual, and physical characteristics of rural life and work, there is large need of genuine "appreciation" courses in agriculture which can readily be given, with practical gardening, in schools for boys from twelve to eighteen years of age. "Home project" gardening, now being fostered by the national government, is a valuable means to that end. On the other hand, it is folly to offer expensive education towards agricultural vocations

except to those who will very probably repay society for its investment by their achievements as successful practitioners of the vocations for which they have been trained. Hence vocational education in agriculture belongs chiefly to the country until it is demonstrated that substantial numbers of city boys will, in good faith, take it.

Vocational Aims. — Within the field of vocational agricultural education it is also of no less importance that we analyze sharply the many scores of distinctive agricultural vocations for any one of which, in a complete system of school education, specific training could be given, and for each of which, of course, there has always been available the crude and poorly directed by-education obtained by younger persons working under the guidance of elders. The words "agricultural education" ought to be used only as the words "professional education" are used — in a general sense, and not as descriptive of a field in which or for which a given individual should be prepared, or a single school organized. Let us imagine a college advertising to give "professional education"; the immediate question is "For what profession?" We do not train dentists in the same way that we train lawyers; or journalists in the same way that we train electrical engineers.

Similarly, we should cease to speak of so-called vocational schools as training "farmers" (at least schools of secondary grade; and probably the same rule applied to agricultural colleges in the first and second years of their work would result in great improvement in their aims, methods, and results). Let us rather recognize the fact that some successful farmers of to-day are rendering to themselves and to the nation the best possible service by being successful poultrymen; others through being successful growers of oranges and still others respectively as market gardeners, as "potato kings," as apple growers, as mule-raisers, as growers of corn and hogs, as producers of milk.

But in the vocational training which would make of one boy a successful poultry man, there is practically nothing in common with the training which would make another a successful apple-grower in Oregon, any more than there is in the training that would make of one youth a successful teacher of mathematics and another a successful stenographer. The state of Texas might well afford to have a first class school to train youths of suitable age — fifteen years or upwards — successfully to follow the vocation of rice-growing; but such a school would be an absurdity in New England. On the other hand, ought not New England to have several good schools to train youths successfully to produce apples, or milk, or cranberries respectively?

There survives, of course, and especially in the Atlantic States, the tradition of the "all-round" farmer — the farmer who has two or three cows of rather low productivity, a few hens, an assortment of fruit trees, a hay meadow, and a tilled section whereon he tries to grow corn, potatoes, and cabbage. Is it worth while to try to train a new generation for that kind of "agriculture"? It had its attractive sides doubtless, but it fits very poorly into the economy of the twentieth century. The all-round farmer must follow the jack-of-all-trades, the "general merchandise man," and the "handy man."

There will remain, of course, "complementary farming" — complementary in the parallel sense, as where one farm produces corn for hogs and hogs for the market; or in the alternative sense, as where soil must, for its fullest health, have successive crops of corn, oats and clover. But in training a youth for one of these fields of agriculture, education in the technique of each complementary part would constitute but one stage of his unified training for the one agricultural vocation as experience demonstrates that to be best organized.

But why does Dr. Eaton say "under a democratic form

of government it is not possible to prognosticate with sureness that any boy will become a farmer, much less that he will take up a certain definite type of farming in a known locality"? What bearing has that fact on the offering of definite programs of genuine vocational education towards any one or several of the numerous agricultural vocations? Suppose we say: "Under a democratic form of government it is not possible to prognosticate with sureness that any boy will become a dentist or a bookkeeper or something else." Has that any bearing on the policy of establishing a good vocational school for those who make up their minds that they wish to be dentists in view of the fact that the market can yearly provide place for an ascertained number of new dentists?

If investigation in eastern Massachusetts shows that a substantial number of properly qualified young men can each year find profitable careers in specified types of market gardening, why should there not be provided a school, or department of a school, having the training of successful market gardeners as its distinctive end? Can we stop short of this in the logical evolution of publicly supported vocational education? Is not this the only method by which education can be made truly democratic? Dr. Eaton himself says:

"Indeed it is very desirable that such general analyses of different types of farm life in various regions be made (*e.g.* of the factors of successful life on a dairy farm in the New England states), if we are to succeed in a close adaptation of the educative process to individual and community needs."

But after this, what is the need of a "general scheme" to which the paper seems devoted?

"The problem in any general scheme becomes one of study of the type activities, so far as such exist, inherent in a life spent in production from the soil."

But does not this proposed "general scheme" lead us

again straight towards the educational mysticism (and, in the hands of reactionaries, obscurantism) which has so long baffled the development of good vocational education, and which, also, under the guises of "culture," "humanism," and "mental discipline," has even baffled the development of anything like a truly democratic liberal education in the schools of the people? We need, indeed, general schemes of liberal or common or general education because through that we are laying foundations for general culture, common morality, democratic ideals and patriotic citizenship; but in vocational education we must perforce follow the specialization produced by economic forces which the schools can no more control than they can control the motion of the planets.

Specialization of Function. — One can agree with much that Dr. Eaton says regarding the desirability of having "type projects" (in vocational agricultural education) include "complete cycles of production" even when these include the primary elements of "production" as well as the secondary elements of "distribution." But unless this ideal is interpreted in its quantitative as well as in its qualitative aspects, there is every probability that our agricultural schools will have their young learners floundering and bemired in endless swamps of unassimilable technical knowledge (the figure is not nearly so mixed as the actual situation depicted — which can still be observed at first hand in many of the agricultural schools the work of which is described in Dr. Eaton's book). It is especially in this connection that educators must get into touch with the tendencies of the age.

"A man who is his own lawyer has a fool for a client." The man who tries to doctor his sick child may be prosecuted. As long as the orange-growers of California tried each to market his own product, they lost more money than they made; when they delegated marketing to experts, the

market was stabilized and rendered a certain source of reasonable profit. Why has the corporation, as a form of economic organization, come to dominate so many fields of production and exchange? Because it best provides for specialization and delegation of service. We are constantly praying farmers to "coöperate"; but such coöperation gets nowhere unless with it there comes employment of specialists and delegation of function. The apple-growers of the northwest have nothing to do at first hand with the standards of packing of their apples any more than a patient in a hospital has to do with the running of the hospital. These apple-growers have been wise enough to recognize their own limitations — and also wise enough to know the value of employed specialized service (becoming expert just because it is specialized) when that service is carefully chosen and its output scrutinized. In other words, these farmers, as regards packing fruit, do just what all intelligent men do in the use of medical and other specialized service — they learn to distinguish the false from the true, the efficient from the inefficient, and then delegate responsibility.

Now, in the framing of plans of vocational education for agricultural schools we must go chiefly to the practice of successful modern farmers for guidance. We must distinguish sharply between those capacities or powers of the successful farmer involved in abilities to *do,* to *execute,* or to *perform,* and those other capacities or powers involved in abilities to *appreciate* the need of the services of others and to *appraise* or *evaluate* that service when rendered by them. The range of the former requirement narrows year by year as civilized society becomes more complex; while the range of the latter widens. In the process of distributing the meat products of the country there has evolved a technology so complicated that no one man can grasp more than part of it; what should or can be the cattle grower's knowledge or appreciation of that technology?

M

We have in view here a problem of educational objectives as to which I think Dr. Eaton has the correct prospective, but which he seems to have failed to set forth clearly in the article referred to. It is a problem in discussing which we need help from the analogies of local and marginal fields of vision, or of primary and secondary returns (product and by-product) in any field of economic production. For concrete illustration, let us take the case of a class of boys of sixteen who have elected to prepare themselves for poultry-raising as a vocation.

It is clear that each of these boys in his earliest year-round project must learn by first-hand experience to do the necessary work of feeding, sheltering, and guarding a workable number of chickens. Should he learn to build an incubator? Probably not; specialists can do that far better than he. How far should he learn the principles of its operation — as far as he knows the principles of operation of the watch that he carries, or as far as he is expected to know the principles of his father's automobile which he drives? Clearly he must learn so much of the mechanism, in each case, as is essential to his responsibilities in the operation of it — and the age moves steadily towards "fool-proof" machinery.

The boy has to buy most of the food for his poultry. What does he most need to know (remembering that he has only one thousand hours in which to learn, under school direction, all that he expects to get relative to poultry-raising) about the available foodstuffs? Here the purpose is to make him a good buyer — a good appreciator or appraiser of the services of others. Conceivably, the best advice that can be given him is to consult an expert and abide by his recommendation, rather than to try to be his own lawyer, and to awaken too late to the fact that he has a fool for a client.

Focal and Marginal Fields. — In other words, at every stage in successful vocational education towards one of the

agricultural vocations there must be a small focal field in which skill of planning and performance is the controlling objective, and towards the attainment of which skill daily hard work, rigid thinking and painstaking reading must be insisted on. Here, thoroughness, accuracy, industriousness, conscientiousness, in the senses ordinarily thought of by master workmen, army officers and disciplinarians generally, must dominate.

But besides this there may be a very wide marginal field, a mental and physical penumbra, in which the objectives are less clearly defined, and in one sense less important. Here general reading, an occasional lecture, incidental reflection, and other means of unforced education or even by-education (by-product education) may well suffice. If we could clearly define and illustrate the differences of the two classes of objectives here referred to, a paper on agricultural education would not dismay us by its apparent insistence that for one group of projects, the related "technological study will cover the chemistry of plant and animal life, the physics and chemistry of soils, tillage, manuring, drainage, irrigation, plant and animal pathology and sanitation, economic entomology, feeding; and the implications lead to botany, zoölogy, geology and geography as well as to the sciences already mentioned."

The writer suggests the following as one method of study for educators bent on working out curricula of vocational school education for the agricultural vocations. There are in America perhaps ten million men now following these vocations. Of these perhaps five million are reasonably successful, having in view, on the one hand, their native endowments and the opportunities made available by nature in the regions where they live; and, on the other, the standards by which we judge successful performance in other fields for persons of corresponding abilities and natural opportunities — physicians, high school teachers, retail merchants, artisans, sailors, hotel-keepers, teamsters, etc.

Now, what are the powers (of personal execution) and capacities (for appreciation of powers of others) typically found in these successful farmers — appraised quantitatively as well as qualitatively — according to their several specialties — market gardener, wheat-grower, cotton grower, dairymen selling milk to creamery, etc.?

Which of these specific powers and appreciations has been acquired at too great cost because, in the absence of direct vocational education in schools, the man had to get them via the wasteful by-education of experience? In what specific respects have these men failed to attain powers and appreciations which a good school could give? Until we shall have made some such analysis as this, it is to be feared that our school programs of vocational education for the farming vocations will be bookish, academic, theoretical, because they will aspire to be to the fullest extent general, technical, and scientific. Educators are slow to learn due moderation of ambition and demands. They often aspire to conquer the world only to find that they have lost even the homestead.

III

Problems. — Several very unsettled problems as to the careers probably open to the boy trained in some variety of farming still await solution. Some of these grow out of the fact that in many parts of America farming is only now passing out of the hands of those who, on homesteaded public lands, redeemed their land from its original natural conditions. Others are due to the enlarging part played by capital in modern, and especially American, agriculture. A third set of problems arises from the temptations presented by industrial, commercial and even professional occupations to young men who have ability and can obtain prolonged education but who do not expect soon to possess capital.

1. **The Acquisition of Land.** — Throughout the entire history of America, until near the close of the 19th century, the youth or young man desirous of beginning work as an independent farmer could easily find fresh land "to the west." Frequently he could secure title to this during the years that he was working for wages, acquiring a small capital and farming experience. Furthermore, as the region settled and transportation conditions improved, even his imperfectly cleared and cultivated land gained steadily in value. A sober, hard-working man, notwithstanding very incomplete training as tiller of the soil or stock breeder, would often find himself comparatively early in life the possessor of considerable wealth — he had become the independent, managing, capital-owning farmer in whom America has taken such pride. He it was whom the sociologist Ross had in mind when he wrote that it was doubtful if any other act of legislative body, American or European, had conferred so many blessings on humanity as our "homestead law" which provided in large part for the disposal of public lands west of the Alleghenies.

What will be the history of the generations of farmers yet to come? We must assume that usually the beginner in this, as in almost all other vocations, must start with little or no capital and with only small and precarious credit. Commercial and industrial fields of work have simplified the situation by opening endless opportunities for the young man to begin as wage-earner, or as learner on some form of commission basis, and, as he accumulates capital and experience, to work into more responsible positions and even to use his capital in "the firm." Agriculture, too, offers endless openings for the hired worker; but does it, or can it, offer similar or equal opportunities for advancement, for the "investment" of special training, experience, and working capital? That is not yet clear. In the older states, it is noted that tenant farming is steadily increasing. Prob-

ably much of this is due to the supplanting of the older generation of farmers by younger or more vigorous immigrants. But it is to be expected that many of the sons of farmers will themselves begin their careers on other than a "hired labor" basis, as renters or tenants — on their parents' land or elsewhere. At what age and under what conditions will a young man probably thus become a self-directing farmer? Undoubtedly, the answers to this question will have much to do in determining the scope and character of the vocational agricultural education to be given in the full-time school of farming. If a youth, say eighteen years of age, must expect to spend five or six years merely as a hired man or helper, perhaps largely on an "occasional job" or "casual labor" basis to an active farmer, then it remains still an open question as to how far it is expedient or profitable to teach him in detail the arts and sciences of farming practice — manual performance or managerial — during his adolescent years. If, on the other hand, agricultural production were so organized, or could be so organized, that the young man, on graduating from a school of agriculture, could put his skill, knowledge, and powers of planning into actual practice, as is so largely the case now in the industrial and commercial callings, then there would exist the best of reasons why these schools should be extensively developed and why prospective farmers in large numbers should take advantage of their offerings.

We do not yet know, of course, how far vocational training can be kept effectively in "cold storage." That is, we cannot tell how far the skill, technical knowledge, and managerial ability developed in a youth of eighteen will survive until he is twenty-six if he be given little opportunity in the meantime to put his powers in these lines into active and responsible practice — responsible, that is, in the sense that his success or failure in any given practical project will depend upon his own skill, his own knowledge,

his own planning and managing ability. It seems to be an unfortunate fact that the average farmer, and perhaps the successful farmer most of all, is disposed to give to his employed subordinates, and even to his own sons, little opportunity for taking the initiative or exercising independent judgment. Quite frequently he shows no desire even to receive their suggestions or advice.

It is possible that farmers whose sons work out "home projects" in practical schools of agriculture can be persuaded to see the very great value of allowing these boys, on completing the requirements of schools of agriculture, to share in the direction of the home farm on some form of minor partnership basis. Obviously, the directors of these schools should actively interest themselves in the after careers of their pupils, for otherwise a large part of the expensive training of these schools is apt to prove "non-functional."

2. **Enlarging Capital Units.** — Even more difficult problems are found in the shifting status of agriculture as regards the normal amount of capital investment required for most profitable farming in most parts of the United States. In many parts of the country the best farming now involves a capital investment in land, building and tools of from $10,000 to $50,000. Only exceptional persons, working on their own resources, can hope to accumulate a capital of even $10,000 by middle age. Farmers' sons, belonging as they do, to a capital owning class, may expect to inherit the ancestral capital eventually; but, unless American farmers should elect to repeat the disastrous practice of French land-owners in closely limiting the size of families, each son could expect to inherit only from one fourth to one sixth of the ancestral property, and, of course, that inheritance will, on the average, only take place when the representative of the new generation himself reaches middle age.

There can be no question but that the greatest crisis con-

fronting the present individualistic organization of agriculture in America is due to the enlarging use of capital made necessary by progress of invention and specialization on a territorial basis of production. There are those who hope and anticipate that intensive farming on small lots of valuable land will enable us to preserve the status of the independent, land-owning farmer with capital of from $1000 to $10,000. But this will certainly necessitate either some form of collective ownership of teams, power-driven tools, sources of water supply, storage apparatus, and the like; or else the complete relegation of these to corporations, as has been the case in sugar production, butter and cheese production, fruit packing, meat packing, etc. Collective ownership by land-owning farmers themselves of necessary adjuncts seems to have proved successful only in some cases of water supply (for irrigation), fruit packing, and grain-storing plants, etc. Community ownership of ditching and tilling apparatus and expensive breeding stock has proved successful also in some cases, but against these we have to place the rapid growth of privately and separately owned elevators, threshing outfits, seed and fertilizer supplying agencies, and high grade breeding animals. It may be (and for social reasons it is to be feared) that the amounts of capital hereafter necessary in agriculture of the kind which, over the generations, will yield the maximum amounts of product (by which test any form of agriculture will eventually rise or fall) will compel corporate ownership and direction of nearly all if not all the immediate and related factors in this field of production, as has already become the case in manufacture, transportation of commodities, distance communication, exchange of commodities, capital investment, etc. Corporation-conducted agriculture would, of course, offer greater opportunities for the trained man possessing no capital than does the present situation.

It is possible that governmental provision of working or

"turn-over" capital (not capital for fixed investment, at least in land) will help solve some of the difficulties presented to young men who can rent land and possess the qualities and characteristics necessary to obtain credit. But it is doubtful whether this stage can be reached, for the average man, under twenty-five to thirty years of age.

3. **Leaving the Farm.** — The refusal in many cases of farmers' sons to become farmers themselves is a very old phenomenon, but one which has not greatly disturbed students of social problems until recently. "The drift from the country to the city" has been in large part, for the nineteenth century, a quite normal and inevitable result of economic transformation, whereby the professional, industrial, commercial, and transporting occupations, which have in all civilized countries expanded much more rapidly than agriculture during the nineteenth century, have been concentrated in or about urban centers. The increasing use of machinery in tillage and harvesting has greatly diminished the amounts of labor required to give a stated quantity of farm products.

Furthermore, the status of that man who possessed insufficient ability or capital (or both) to become at least a tenant farmer, and who must therefore earn a living as a wage-earner, has long been far less satisfactory in the country than in the town, and conspicuously so if he had a family. Continuity of labor, shelter while working, available quarters to be rented for his family, inexpensive diversions and recreations, — all these the laboring man has been able to find more or less abundantly in industrial and commercial centers, while they were exceedingly precarious in rural areas. Farms conducted on the scale and under the conditions common in America require large amounts of hired labor for certain short seasons. But the owner and his family commonly supply all the labor needed during the remainder of the year. In many sections of America this

condition has produced either a permanent scarcity of farm labor (even while immigration to the country has been at its maximum) or else has been met by the stimulation of a flow of casual labor of a highly irresponsible kind, consisting chiefly of single men who can live during the dull seasons by methods well known to the semi-vagrant.

From the standpoint of the rural sociologist the "drift to the city," has seemed chiefly objectionable because of its tendency to carry away the keenest, most enterprising sons of the soil. As in the case of the diminished birth-rate which dismays the student of eugenics, it is *differential* tendencies in favor of the least fit that constitute the real menace, not the phenomenon as a whole. In some sections, almost the entire original agricultural population has disappeared, leaving the land in the possession of recent immigrants as tenants. In other places, selective emigration of the more enterprising has been so long in process that the remaining inhabitants seem to be, socially, and even biologically in some cases, literally "dregs."

And the end of this selective movement citywards is not yet, largely for the reasons given above relative to the difficulties experienced by a young man in getting "started" in independent farming. The ladder of ascent to competency and independence is, for many, far easier and more satisfactory in the non-agricultural callings.

It is obvious that administrators and teachers of vocational education for the farming vocations must study these problems and take heed of the results of research even now being promoted towards their solution. Programs of alleged vocational education formed in obliviousness to the significance of these problems will result in waste of public funds and forfeiture of public confidence.

IV

The "Project" Method of Teaching Agriculture may best be understood from a summary of the conditions which ideally might be expected to prevail:

1. The "school" for one teacher consists of two rooms, the first, a classroom including office for the instructor, the second, a reading room for pupils, both designed to afford, at the maximum, accommodations for twenty persons. These rooms may be in a local high or elementary school, a small house, or a vacant store.

2. To be admitted to the school, a pupil must: (*a*) be at least fourteen years of age and have completed minimum requirements of elementary school attendance; (*b*) be prepared to give at least 1200 hours per year to practical work and 400 hours to related reading, study and class work, the whole time to be distributed to the best advantage of the project he undertakes; (*c*) be able to obtain on a rental basis from his father (or other responsible source) sufficient land, live stock, seeds, fertilizers, tools, supplemental labor, and new capital investment, properly to execute a project; (*d*) be able to obtain stipulations that products supplied to the home from his project shall be paid for exactly as if purchased in the market.

3. The instructor shall be a man possessing, on the one hand, technical college training, at least along the line of the projects which it is desirable to have taught locally; and also practical experience in the successful management of a farm or of projects on a commercial basis. He shall be expected to spend an average of not less than sixty hours per year in actual contact with the projects of each boy *at the scene of this work;* and he should be provided with the best means of travel for this purpose that local conditions require (in densely settled areas, street car or foot travel will serve; in more scattered areas, motorcycle, automobile,

buggy, or saddle horse). The instructor, having from ten to twenty boys (a larger number will usually be impracticable), should be prepared to give full time to his teaching work (except a vacation period during December and January or other months of little farming activity) and only incidental time to community service or expert work apart from teaching.

4. The standards of the school shall require that each boy undertake a project of sufficient magnitude and probable value to yield him a reasonable labor return (or labor and profit returns distinguished) for his work after rentals, wages, and borrowings shall have been met. For a boy fifteen years old, accustomed to farm labor, a net labor return of nine cents per hour ($100 to $108 for the year of 1200 hours) would probably not be unreasonable (1919 prices). For an older boy and especially for a boy working on a second year project, ten cents an hour would be reasonable. If the learner rents cows, horses, orchard trees, hives of bees, or the like, from his father, some arrangement for insurance against capital loss (*e.g.* by death of animal) should be made,

5. For each approved project the school should supply a booklet describing stages, sub-projects, and giving ample general directions, including for each step a list of page references to books, bulletins, and other reading available in the library. The learner must be required to obtain the instructor's approval to his plans for each succeeding step; and as preliminary thereto, the pupil will have read, as fully as practicable, the available material shedding light on his problem.

6. During the year in which a pupil is engaged upon a project, it is assumed that he will not expect to devote his working hours to other ends — such as work on his father's farm or preparation for college. The school should coöperate with him in showing him how to spend his non-work-

ing hours to best cultural and social advantage, — in general reading, music, social games, and the like.

Obviously, the pupil on a serious project (and no play project is contemplated here) can hardly join in the social activities of the cultural high school or in the taking of regular high school studies. Certainly he cannot take "A" class studies designed as preparatory to college. On the other hand, anything the school can now do to accustom the prospective farmer to the richer use of leisure (evenings, holidays, agricultural "dull" seasons) during the times when adult farmers have such leisure will be of the utmost profit. Only the traditions of old-fashioned schoolmasters will preserve the notion that in a vocational school hours from the heart of the working day should be taken either for school "sports" on the one hand, or for liberal studies on the other.

7. It is assumed that the program for the pupil will call for little special or separate study of physics, chemistry, accounting, or even of fertilizers, soils and markets; but that when, in the pursuit of a given project, the learner encounters problems that can be illumined by brief side excursions (readings and a few laboratory tests will usually suffice for the needed appreciation and control), these excursions should be taken to the extent that the time and abilities of the learner permit — which will usually be far short of the standards suggested by textbooks, or formal school courses in these subjects. (It will be hard, of course, for most school men of traditionalistic views to persuade themselves that an average boy can gain scientific insight of useful degree and character except via the old road, dear to schoolmasters, of "principles" first; but men of modern training will "find a new way.")

Pedagogical Principles. — What is the vocational pedagogy of aim and method implicit in the foregoing conditions? These principles at least:

1. The primary aim in vocational training for farmers is to produce the independent planner or manager — the man who is disposed, by long and varied habituation and ideal, to look ahead, to make provision for the future, to prearrange, to "keep his head running in advance of his feet." Secondary aims are technical knowledge and manual skill. Unlike many other vocations, farming, as practiced most successfully in America, throws a maximum of unspecialized responsibility on the individual farmer for scientific planning. Specialization in most commercial and industrial pursuits has given responsibility for planning to high-grade specialists.

2. The pedagogical method of the project is to put the learner in a position where, by aid of expert advice sought when necessary, he must plan and conduct, on an essentially commercial basis, at least for one year, one strand or unit of a farming occupation. If, in a given region, successful farming as a whole involves gardening and poultry raising, our young learner, for the sake of successful concentration, becomes a poultry man for one year, a gardener the next, but, in each case, on a commercial basis to the extent of paying for needed hired capital and earning a reasonable labor reward for himself.

3. The essence of successful vocational education as a continuing process consists: first, in the acquisition of skill and managerial ability in such a way that the learner becomes increasingly capable of estimating his own shortcomings and correcting them through self-directed efforts; and, second, in the increasing power of the learner to utilize printed matter as a source of knowledge and direction in new emergencies. Nearly every branch of agriculture has developed a rich technical literature of its own, to which results of research and experimentation are constantly being added. The intelligent farmer who has developed capacities and powers of utilizing and applying published

matter describing advances in his field, is in the best possible position to profit from the results of "scientific" or "progressive" agriculture. For this reason it is to be expected that the boy who has, under the guidance of a teacher, worked to successful completion one or more projects, wherein he has made extensive use of bulletins and other technical reading materials, and, in solving the scientific problems connected with these, has done some laboratory experiments and has carefully read the interpreting scientific literature, — it is expected that this boy, as a man, confronted by new problems in a field already somewhat familiar to him, or by the problems presented in quite a new field, will very naturally at once utilize his powers of assembling and reading scientific materials and applying the results to the specific situations confronting him. The flexibility of mind and resourcefulness as regards means and methods that should result from right use of the project method will abundantly justify a considerable investment of money in securing persons properly qualified to execute it.

V

Rural Schools and Vocational Education for the Farming Callings. — The historic rural elementary school has had poor equipment, short school years, transient and untrained teachers, meager supervision, irregular attendance, and excessive numbers of grades. The historic rural high school has been understaffed and underequipped while its curriculum offerings have been excessively formal and quite unrelated to local needs. During the last few years some brilliant experimental work has been done in developing improved types of rural school organization, and in reconstructing courses of study. A wealth of "aspirational" literature has also appeared, some of the implicit programs of which are probably hopeless, while others may prove workable.

Actual aims of rural school education beyond the primary grades remain as yet largely undefined, except in the vague language of undiscriminating generalization. In the aspirational literature referred to it is constantly held that "the rural school must fit for country life"; and it is incessantly urged that "agriculture" must be extensively taught. It is often charged that rural school curriculums have been unduly influenced by courses, textbooks, and principles of method devised for city schools. Recently large hopes have been built on the "agricultural high school" as a means of vitalizing secondary education.

It is obvious that the problem of providing vocational education will be peculiarly difficult in the country; since, ordinarily, vocational education involves so much specialization. Where agricultural conditions are favorable a substantial proportion of farm boys become farmers; but under the socially dynamic conditions which have prevailed in America for the last century (and which will probably prevail for the next century) anywhere from thirty to seventy per cent of farm boys have eventually followed other vocations than farming — the professions, mercantile life, transportation, and, to some extent, industrial pursuits. Now that public policy contemplates making opportunities for vocational education in schools available for every one, the problem of providing such opportunities for country children must be faced. If the mountain will not come to Mahomet, the prophet must go to the mountain. We are here faced with the old problem of the advantages of country life versus those of city life.

Compared with the city community, the country community has certain advantages, and also certain disadvantages. City dwellers find access to stores, churches, schools, and theaters easy; their mail comes more frequently, their newspapers earlier; by night their ways of travel are better lighted; and means of speedy travel are more available.

But the country dweller has more air, more sunshine, more quiet, and more varied points of contact with nature than his city brother. Most thoughtful people agree that it would be better, on the whole, if all children could be reared, at least to sixteen years of age, in a country community or in a clean, small village (many small villages are less clean than large cities), where the agricultural occupations predominate.

Life in cities makes urgent and necessary certain forms of coöperative effort, which, when realized, add decidedly to the attractiveness of city life. Drainage, water, streets and walks, lighting, policing, fire protection, free delivery of goods — these, coöperatively provided in the city, must in the country be procured chiefly through individual effort. But the country should in return enable a man of given ability to support himself and to build up a competence more certainly and easily than in the city.

We are learning that coöperative effort on a much more extended scale than now practiced is possible and desirable in country communities. In literally hundreds of directions the opportunities for this are being discovered and defined. But, unfortunately, the country community often does not develop men and women who have powers of invention and initiative adequate to meet local needs for varied coöperation.

Where one hundred thousand persons are gathered together in one compact community there are sure to be among these a half-dozen persons who combine great ability and great interest in some one phase of coöperative activity. Thus parks, schools, art museums, streets, monuments, theaters, lighting, drainage, water supply, social centers, free hospitals, charities, boys' clubs, and the scores of other joint enterprises of the city have each their little group of partisans, supporters, experts.

Such specialized service and interest are hardly practi-

cable in the country except over areas too vast for easy intercommunication. New devices must be employed. Action by the state, or by large coöperative organizations like the Grange, may be necessary. The country must gradually, by its demands, call into existence and build up special agencies like the Extension Service of the Agricultural Colleges, Packing Associations and County Agent work.

The country is necessarily always at certain disadvantages in organizing and providing schools. Less specializing of teaching service and supervision, less grading in homogeneous groups, and fewer varieties of educational offerings — these limitations are inevitable. Probably when we shall have learned more of the values of the by-education that accrue from few rather than many associates, life in the open, and early beginnings of normal physical work we shall realize that the country offers large offsetting advantages; but as to these things we yet possess only faiths, verified by but little knowledge.

Country youths will, therefore, have to go to urban centers for education for most vocations other than farming. At any rate they will have to go from home. In time it may prove sound public policy for the state to meet the expenses of travel and residence away from home on the part of those who in good faith seek preparation for vocations other than farming.

To what extent can the farming vocations be taught to youths and adults while living at home? This question brings into relief a series of problems regarding the aims of all education in and for rural communities. The following findings are submitted as contributions to a discussion by no means yet finished.

1. **The Aims of Rural School Elementary Education** should *not* be fundamentally different, nor, as aims are commonly stated, at all different for country, as against city, children. It is desirable that country children should learn to read, write, and spell no less and no differently than city

children. Country children should learn something about American history and world history no less than corresponding grades of city dwellers. The geography of Asia, Africa, Europe should be learned to the same ends, to the same extent, and probably, in the main, by the same methods by country as by city children. Music, literature, hygiene, good English expression, science and practical arts should be studied in the country to substantially the same ends as the subjects should be studied in the city.

The *methods* of rural education, it may well be contended, should, in the case of country children, differ from those for city children; but for purposes of adequate analysis this simple differentiation is too crude. The *aims* in teaching the geography of Asia to country children will be the same as for city children, as stated above; but in teaching the geography of Asia, the efficient teacher will use to the utmost, as *apperceiving* knowledge, everything practicable in the environment of the children — narrow streets and crowded city blocks in some schools, desert wastes in others, and fertile river bottoms in still others, according to local conditions. Hence not only will the *methods* used in teaching the geography of Asia differ as between good country and good urban schools; they will differ no less as between a country school in Southern Illinois and a country school in the dry lands of Utah, or as between a city school in San Francisco and a city school in Rochester.

We certainly expect, in all good elementary schools, to have nature studied; and sound aims for this subject will be the same for all kinds of schools dealing with children of like ages. But nature study must seek, as its central purpose, to render appreciable and intelligible the natural environment of the child — the environment of stars, mountains, and valleys, water courses, plants, animals, and harnessed natural forces. But the natural environment of the child on Cape Cod in winter differs very greatly from the

natural environment of a child in Southern California springtime, both in town and country. The natural environment of a child in a mining town of Northern Minnesota differs greatly from that of a child in the East Side of New York. Hence the methods and means of teaching nature study will differ greatly between one city and another city, and hardly less between one rural school and another.

Obviously the same conditions differentiate the methods of teaching hygiene. The essential aims in this subject may be expected to be the same wherever good teaching prevails. But specific objectives of attack and utilization of local conditions will differ greatly, as between different cities or different rural communities no less than as between rural community and urban. The importance of pure water is the same everywhere; but the means of controlling its purity will of course be taught to children along lines of local conditions, varying from those found in New York City with its superb supply of pure mountain water to St. Louis with its system of filtered river water; from a foothill home in New York with a splendid spring to a home in flat lowlands where shallow wells furnish the only supply available.

2. **Rural Secondary Education.** — Will the *aims* of rural secondary education differ from those of the city? Secondary education now includes two very distinct species — namely, general and vocational. General education includes the cultural, civic, and physical. Let us consider general education first. On the plane of general secondary education (for normal children 12–18 years of age) the first fundamental aim is to secure *common* powers and appreciations in those matters that are essential to social solidarity. In part, these ends are realized through the by-education of association and participation in common activities made possible in town and country alike by school attendance. In part, they are realized through such studies as assure

common standards of cultural and civic habits, appreciations, aspirations, ideals, and insights — along such lines as speech, manners, hygiene, criteria of moral behavior, understanding of social environment, comprehension of structures and functions of government, appreciations of social forces operative throughout the world. In part, also, the ends of general education are to be realized through cultivation of *individual* interests and talents towards cultural and civic leadership — in music, plastic art, foreign language, science, craftsmanship and the like. What should be the weightings of time and energy given respectively to these two types of requirements in secondary education we do not yet know because we are still deficient in reliable sociological standards of educational aim.

Is it at all probable that the *aims* of general secondary education will differ greatly as between city and country? In what respects? And for what reasons? A few surmises may safely be hazarded. Probably literature should be made more of in country than in city schools for the reason that the country dweller's life shuts him away in large measure from the means of congregate use of leisure — theaters, lectures, museums, clubs, etc. Perhaps we need give less attention to the physical training of rural than of urban boys because of the more favorable physical environment of the former.

In every case, of course, *local* conditions will be utilized as far as practicable as means and methods of realizing aims, whether these aims be identical or different in the case of rural and urban dwellers. Community civics in the city will certainly be taught in terms of city blocks, street-car transportation, easily accessible markets, omnipresence of commercial entertainment, commercial drainage and water supply, and urgent needs of physical facilities for play. In the country the same subjects would be taught in terms of line fences, difficulties of congregation, remoteness of markets,

unavailability of commercial entertainment (except literature and mechanical music).

Biology taught in rural high schools will, we should expect, like the nature study of the grades, be interpreted largely in terms of local and accessible examples and conditions, just as should be the case with the subject when taught in the city. But conditions for the teaching of biology in rural high schools will differ no less as between the dairy regions of the Adirondacks and the swamps of eastern Texas than between a "typical" rural, and a "typical" urban environment — if experience should show us that there are such things as types in these matters.

3. **Agriculture in General Education.**— Many high schools now offer one or more "agricultural" courses paralleling other general courses, such as English literature, foreign language, history and physics. Agricultural and some other colleges have been persuaded to grant entrance credit to a moderate extent for this work.

In many cases it has doubtless been the desire and intent that these agricultural courses should "function" vocationally. To some extent laboratory and field experimental work supplemental to textbook studies has been developed and in a few notable instances really fine coöperative projects and individual productive work have been undertaken. Not infrequently it has been possible to obtain enthusiastic teachers from the agricultural colleges. There is available a wealth of splendid textbooks on the various phases of agriculture, and supporting the whole are the contemporary enthusiasms for better farming, "country life" and "back to the country" movements.

But it is doubtful if these high school agricultural courses function to any important extent in vocational powers. To some rare spirits they probably yield a stock of appreciations and ideals that may lead later to vocational study or practice. At their very best, these schools can offer only

"agricultural technical instruction" — a very valuable contribution to vocational powers when taken strictly under the conditions of extension education, but of very doubtful worth, except for a possible two or three per cent of "abstract" minded students, as a substitute for basic vocational education.

But these courses are, or can easily be made, valuable factors in general or, more expressively, liberal education. By any adequate definition, the aims of liberal education should include the development of a large variety of appreciations, aspirations, ideals, and sympathetic insights relative to the material and social environment of the learner. Any one of the many excellent textbooks on agriculture now available, taught to interested pupils by an enthusiastic teacher, following "beta" methods, will certainly yield rich fruit of culture and civic insights.

The writer has now before him such a book. It goes in detail into the wonderful modern developments of seed corn testing. It has an illuminating chapter on wheat. Alfalfa, irrigation, vegetable gardening, breeding of poultry, classes and grades of horses, erosion of soils, and scores of other alluring topics (to the healthily curious mind that likes that sort of thing) are treated with abundance of illustration and simplicity of language. Probably the book was designed to help train boys to become "general farmers" in the Middle West. Certainly it has no message for prospective producers of tobacco, grapefruit, cotton, cranberries, greenhouse products, oranges, bees, clams, hares, or range cattle. On the other hand its range is clearly too vast for any one individual seeking to become a proficient producer of one major and two minor "money making" crops, even in the Middle West. Perhaps it was designed to serve, like a dictionary or encyclopedia, as a reference work, each learner abstracting the things he most needs; but has any one found a book so used in high school agricultural courses?

But with proper methods of treatment the book could be used to excellent advantage as the basis of a "liberalizing" course in agriculture. Suppose it included topics not now included — on cotton growing, orange production, and white pine "cultivated" forests; suppose it discussed the rich possibilities of clam farming, vegetable drying, the total extermination of certain pests; suppose it took us over the world to see coffee, rubber, and tea plantations as well as Chinese gardening, Stassfurth potash mining, nitrogen fixation in Norway, and swamp-clearing in Florida; suppose finally, it helped initiate us in an understanding of modern farm machinery, agricultural science, world markets and the territorial specialization of agriculture — would not all this be "liberal" education — and for city boys no less than those destined to remain in the country?

It may be doubted, indeed, whether agricultural courses as now organized and administered do actually realize these ends of liberal education. For one thing their objectives are not well defined. The teachers are usually striving, probably with futile efforts, to produce vocational powers. They therefore require just the kind of memorization, passing of tests, and attention to detail that kills the spirit of truly "liberating" education. They grind, drive, examine, and "flunk." The subject becomes neither the fish of vocational education nor the fowl of liberal education — and therefore it now tends to become the red herring of "college preparatory work" for pupils who are not good enough for the classics. When once the colleges — agricultural or other — begin to enforce prescriptions as to what shall be the "content" of high school agriculture then indeed the subject will be hopeless as material for good secondary education.

But we ought to save it. Let our junior high school make much of home gardening — always utilizing to the maximum the amateur spirit. Let our high schools offer short

courses — none exceeding one hundred hours — in "Agricultural Science," "American Agriculture," "World Agriculture," and "Amateur Gardening" which shall be inspirational, vision-giving, enthusiasm stirring. These courses will not prepare people to succeed in any one of the hundreds of possible agricultural vocations; but they may guide some choice spirits towards farming, and, of equal importance, warn some unsuited persons away; they will surely serve to indicate to prospective farmers the great desirability of definite vocational training therefor, and the best means of obtaining it; and they will give to nearly all some vision, some finer aspirations, some ideals which will function in personal culture and good citizenship.

4. **Vocational Secondary Education** for the country will, however, differ greatly from that for the city, will it not? Does this question mean the opportunities that will be provided for country boys, or does it mean the types of vocational schools that should properly be placed in a country environment? If the former, not at all; if the latter, the reply is, certainly.

Country-reared boys may be expected to scatter into a great many vocations. Some become respectively doctors, lawyers, teachers, engineers, ministers. Many enter upon commercial pursuits. They move in large numbers to industrial centers and enter upon trade and factory callings. But vocational schools for any of these various callings are likely to be located in transportation and population centers. Thither country boys, village boys, and city boys will move for vocational education.

On the other hand the city is no place for a good school of agriculture any more than it is a good place for a school of mining, navigation, astronomical research, or forestry. Hence both country boys and city boys, seeking good vocational schools in these lines, will have to go to places suitable for the conduct of such schools.

Of course, relatively few city boys may be expected to seek admission to the farming vocations; and, vice versa, a relatively large proportion of country boys ought, conditions being normal, to aspire to farming callings; but these facts must be further analyzed before we can say with easy assurance that "country children require a different education from city children."

Of the many semi-illusions found in current aspirational writing relative to rural education none is more deceptive than that cherished under the ideal of the "agricultural high school." Those who believe in the practicability of a "blend" of liberal and vocational education see in the agricultural high school an institution which will be increasingly attended by all country children between 14 (perhaps 12) and 18 years of age, and in which the objectives of liberal and vocational education will be pursued almost, if not quite, simultaneously, the one lending motive and inspiration to the other. This vision further requires that at the end of the twelfth grade all graduates will receive the same diploma and that colleges will give credit towards admission to units of agricultural work on a par with other subjects.

No one will dispute the practicability of offering in rural high schools very good academic courses in agriculture parallel with courses in foreign language, history, English language, science, and mathematics. Excellent textbooks and manuals of guidance for laboratory and even field work are abundantly available. Graduates of agricultural colleges are usually fully as well equipped to present agricultural instruction as are graduates of other colleges to present French, chemistry or modern history. For many students, certainly, the work so offered will prove no less "liberalizing," "culture giving," and "disciplinary" than algebra, physics, or Latin.

But, considering the ages, the antecedent and parallel experiences, and the probable motives of the students, will

it prove effective as vocational education? The man of academic prepossessions will probably reply "yes." So also will the layman who thinks uncritically, and whose imagination is carried away by the mysteries of test tubes and the suggestiveness of well-illustrated textbooks. What will the critical investigator say who seeks to measure results in vocational education by starting with the ascertained requirements — in terms of the particular manipulative skills, concretely described general and detailed knowledge, definite managerial powers, and functioning ideals — of a designated type of farmer's calling? Will it appear to him probable that vocational powers genuinely worth while can derive from "studies" predominantly academic, pursued as basic vocational education by students of the usual high school type? It remains doubtful indeed in spite of the alleged success of some experiments "carried" by the enthusiasm of some rare genius in modern education.

To the writer it seems strongly probable, as stated elsewhere, that as experience accumulates and is subjected to accurate testing it will be found that effective vocational education is to be accomplished only under conditions of concentration analogous to those required of workers engaging definitely in full time productive work. If a boy has 1500 or 1800 hours available for purposes of vocational education in a farming calling or one strongly marked strand of a farming calling, it is probable that many times as much power will be gained by concentrating them within one year of strictly vocational work at the rate of five or six hours daily for 300 days (or 365 days in the case of live stock projects) rather than at the rate of two hours a day for 200 days during four years while giving needed attention to parallel studies so engrossing as foreign language, mathematics, and history.

If these contentions are correct how may we expect to find basic vocational education for the farming callings

organized in the future? For boys from fifteen to nineteen years of age, resident on farms, the "home projects method" will undoubtedly prevail. Where twelve to twenty boys can be found ready each to give a year to definite training, a school can easily be organized. Practically all that is required is a live and practical teacher, a central meeting room, a good collection of agricultural reference reading, and "project outlines" for each student.

Under the direction of the teacher each boy plans, preferably in the autumn, for his project. To be an effective means of education in managerial responsibility it must be of good size — preferably netting the boy at least $100 for his year's work, and claiming, for actual performance and related study, not less than 1000 to 1500 hours in the year. Of course, the boy is expected to rent land, hire equipment and excess labor, and buy seed and fertilizer, under the direction of the teacher, as a part of the management of the enterprise.

The local high school when it can offer room for the center for such a school is doubtless the best and most logical place for its location. But the vocational school should not, ordinarily, come under the direction of the high school principal any more than a law school in a university should come under the direction of the dean of the college of liberal arts. The farm school will, of course, like all other public schools of the area, come under the general oversight of the superintendent of schools whose functions will be chiefly administrative rather than supervisory and whose position is analogous to that of the university president.

There are many reasons why the farming school and the high school of liberal education should be very distinctive in local management. The aims of the two schools are fundamentally unlike. Their time schedules must in many cases be also fundamentally unlike. Live stock projects often permit a fairly uniform assignment of time through-

out the year; but tillage projects make very irregular demands, as affected by weather conditions. In the northern states tillage projects make small demands during winter months while they make very large demands for labor during planting, early growing, and harvesting seasons.

Can or should the vocational student take any "liberal" studies? Obviously if high school programs could be arranged on a "quarter" or other "short term" basis arrangements could doubtless be effected. Historically, the "grammar" school and academy were often attended during the winter months only by "big" boys and even young men. Some "technical" schools of agriculture are even yet attended chiefly by young men able to "lay off" during the farmer's dull time. Certainly some accommodations could be effected for boys required to give not more than three or four hours per day in winter to tillage projects and the related subprojects, technical studies, and general agricultural studies. But, ordinarily, to assume that a boy seriously engaged in tillage, fruit, pig, or poultry projects (an exception may be found in dairy projects) can give scheduled time throughout the usual school year to non-agricultural studies within the customary working day is to persist in a form of thinking which certainly points to dilettantism and trifling with vocational education — a course destined often to produce just the unsubstantial kind of farmer that modern society wants to avoid.

CHAPTER VI

COMMERCIAL EDUCATION

Widespread Development. — Commercial education in schools, whether effective or not in giving actual preparation for the numerous commercial vocations, has been for many years much the most widely developed form of so-called vocational education in either private or public schools. It is a safe estimate that in 1918 over half a million boys and girls were pursuing "commercial" courses in schools in the United States.

The evolution of commercial education is sociologically very interesting. Attending the enormous expansion of business that followed the Civil War was the development of private "business colleges" which at first flourished largely on the teaching of business penmanship, bookkeeping, and related academic subjects. Later they added stenography and typewriting. They competed severely with the regular high schools, and were, naturally, accused of "exploiting" their pupils. Certainly they proved, in many cases, great sources of revenue to clever advertisers. Employers of clerical workers finally formed the habit of turning to these schools for young assistants or minor specialists. Hence, quite apart from their educational functions, they served as means of selection and as employment agencies for young people ambitious and more or less qualified to begin work in some commercial vocation. In some respects they resembled what, in a few industrial vocations, are to-day called "pre-apprenticeship" schools.

Finally the public schools began the development of

"commercial" courses. The rivalry of the fee-charging private schools was, of course, always provocative, and was an especial source of grievance to poor parents who desired full opportunities for "free" practical education for their children. The high schools, too, were being attended by increasing numbers of children not qualified by interest or ability to carry the college preparatory studies. Commercial courses, especially if "short" and of not too exacting standards, were peculiarly suited to these intellectual "weaklings," as they were often regarded. Of considerable importance, too, was the fact that commercial courses were not expensive. As commonly organized and administered they cost no more per capita than the regular academic courses. Even yet special training courses for commercial teachers have been only very meagerly developed. Except in stenography and typewriting, commercial teachers frequently represent no special equipment whatever.

The Popularity of Commercial Education. — Though commercial education has long been much the most widely developed form of so-called vocational education now found in schools, its actual contributions to various forms of vocational proficiency are by no means clear even yet. Why then has it been so widely patronized and supported? Why, especially, do the sons, and in even greater numbers, the daughters of farmers, laborers, and other persons in moderate circumstances throng public and private commercial schools and departments, including the thousands of meagerly staffed ones found in rural and village communities?

Several social conditions must be examined in order to discover explanations of these phenomena: (*a*) The commercial vocations are generally esteemed as being more profitable and respectable than the pursuits of the farmer and trade worker, to say nothing of those of the domestic

servant and the factory operative. During recent decades particularly, and accompanying the enormous developments of transportation, commerce, and the clerical sides of manufacturing, publishing, and public service, not only has the proportion of workers engaged in the commercial callings greatly multiplied, but it is evident that in these fields, too, are to be found some rewards much greater than come to men in other fields. The really alluring business prizes are not now found in the professional callings, but in work somehow related to commerce, — trade, transportation, banking, company flotation, etc.

Furthermore, the commercial callings are essentially urban vocations; and they seem to be well removed from the grimy surroundings of the factory occupations. These factors play a large part in the choice of vocations by young persons. It must not be overlooked that in America, to an extent not heretofore found in history, probably, sons and daughters are expected by their elders to enter upon vocations superior to those followed by their parents — superior in popular valuation at least.

(*b*) It is also a fact that apprenticeship has existed in organized form for very few of the commercial callings. Hence any agency claiming to give vocational preparation for these vocations could easily persuade young aspirants that only through the help of these schools could access to the desired work be procured. This condition has been favored by what has been to the outside world the relatively esoteric character of the commercial arts of bookkeeping, stenography, and, in earlier years, commercial arithmetic.

(*c*) The commercial world has opened up an enormous number of places for women, or more properly, girl, workers. (In popular fiction and probably to an increasing extent in popular usage generally, the unmarried, but as yet distinctly marriageable, woman is a "girl.") But the

large majority of these serve only from three to six years as wage-earners, after which they marry. Hence the "turnover" or "replacement" of these workers is very large and creates a perennial demand for armies of new recruits.

(*d*) Another factor in the popularity of commercial courses is found in the ease with which the appearances of vocational education can be simulated for business callings. In the earlier days of these schools, a man with a moderate knowledge of theoretical bookkeeping and some skill in bookkeeper's penmanship could, if he were clever advertiser, easily obtain a large clientage. When typewriting and stenography evolved as adjuncts in all business, it was easy to provide for the teaching of these arts in schoolrooms and with only slightly modified school equipment.

(*e*) The development of commercial courses in high schools has given large opportunities to provide for students not able to meet the standards of the regular courses. At least in their earlier years high school commercial courses, having no genuine vocational standards, were simply modified "general" courses, but designed to appeal more or less to vocational motives. By many teachers these courses were called "dumping grounds of mediocrity." School authorities saw, in the large attendance they stimulated, proof that the schools were now meeting the "needs of the people." A very large proportion of the pupils attending went, before or after graduation, into clerical or other form of commercial work, even though their compensation must long remain substantially that of untrained workers.

To a large extent, therefore, the extensive development and the seeming popularity of commercial education have not rested on substantial grounds of *bona fide* vocational education. The statement of this fact does not necessarily imply reproach to educators except to that comparatively small number of persons who as private school directors or public school administrators willfully exploited the credulity

of the public. It has been characteristic of nearly all forms of vocational education, including those for the professions, that for long periods they have been administered quite without reference to external needs or effective internal methods. At times this has been hardly less true of apprenticeship than of vocational education in schools.

But criticisms of past efforts must be made and understood, if improvements in the future are to be effected in accordance with sound principles. It is certainly true that the commercial schools of to-day still fall short either of sound conceptions of aim or effective adjustments of means and methods. It is submitted that the curriculums of a substantial majority of the large public coeducational commercial schools or commercial departments in the United States will be found justly open to the criticisms, favorable and unfavorable, suggested below.

Criticisms of Existing Schools. — Let us take the curriculums of some well-known commercial school and apply to them the tests implied in these questions: (*a*) For what distinctive vocations do they prepare? (*b*) How are the standard requirements for these vocations ascertained? (*c*) How are the component elements of the curriculums derived? (*d*) How are adjustments made for different groups of pupils? (*e*) How are proximate and ultimate results of work tested?

(*a*) Examination of commercial courses and of books and articles designed to expound their underlying principles will, it is believed, generally convince the candid critic that, with very rare exceptions, public school courses are not based upon objective analysis of the requirements of vocational life. Rarely are distinctive vocations named, or their requirements defined. Usually it is implied, if not specifically stated, "that secondary commercial education consists of that training, direct and related, which has as its aim to equip young people for entrance into business life."

But in any workable sense, there is no such thing as "business life." The term is too abstract, even metaphysical, for the practical purposes of making programs of vocational education. Would it be serviceable to speak of education for "professional life"? Or for "industrial life"? We should at once be confronted by the impatient question, "What profession in particular are you talking about? What trade, or mining, or factory specialty?"

The president of a city bank, a traveling salesman for cigars, a stockbroker, an expert in advertising, an eight dollar a week typist, a hotel clerk, a cash girl, an expert accountant, a department store clerk selling children's shoes, and a bank clerk operating a comptometer, are all in "business" life; is there any single factor in commercial school education that is "common" to the needs of these various persons in business life, it being assumed that their general schools will have given them the essentials of reading, writing and arithmetic? What are the limits of this "business life"? Are telephone switchboard operators, telegraphers, grocers' delivery boys, fruit commission merchants, editors, hotel managers, division superintendents on railroads, traveling drug salesmen, dental assistants, architects, clerks, all in "business life"?

The fundamental fact, of course, is that there are scores, if not hundreds of distinctive commercial vocations; and many of these may, as regards needed qualifications, resemble each other in no single respect. There are commercial callings that are no less professions in the fundamental, though of course not in the historic, sense of the term, than are the various forms of engineering; and there are numberless other commercial callings which are well adapted to juvenile workers sixteen years of age and of only average ability. There are commercial callings that require exceptional native power and training in certain phases of mathematics; and others that require no mathematical powers

whatever. Some require such highly specialized techniques, as stenography, corporation law, commercial Spanish, or cost accounting; while in others these things are never heard of. A knowledge of commercial geography will, perhaps, function consciously and directly in the life work of one person in a thousand among the millions engaged in "business life"; it will function more or less remotely and incidentally in the work of one in fifty; while to forty-nine in fifty it will have no more vocational significance than the history of 17th century Ukrainia.

In practically all commercial school programs we find "business English" or some similar subject taken very seriously. But what is "business English"? Clearly a good stenographer must possess unusual powers in spelling and punctuation; to what extent as a vocational asset beyond the requirements of cultivated life in general does she need a trained voice? The department store clerk must receive special training in the writing of figures, proper names, etc.; is it urgent that she be taught the accurate spelling of "ten thousand or more common words, with especial reference to the stenographer's eight hundred 'demons'"? Telephone companies, in default of public school training of switchboard operators, give painstaking voice drill to these operatives; but have these business workers any special vocational needs for composition or business letter writing? Or is it at all important that similar voice drill be given to bookkeepers or cash girls?

The same indeterminateness characterizes commercial school mathematics. Until recently few commercial departments had the courage to omit algebra. Held there only by forces of tradition of course, its presence has often been defended on vocational grounds! But what of "business arithmetic"? What of the special forms of accuracy and speed sought in addition, or the special forms of arithmetical content knowledge sought in percentage? For

what vocations, and to what extent in each, are they vocationally essential? We have as yet no accurate knowledge; and, unfortunately, few promoters of commercial education exhibit active desires to get accurate knowledge.

Stenography constitutes an interesting example of ill-defined aims. The vocation of stenographer-typist is the one distinctive calling for which the prevailing commercial school gives functional training. But it has long been clearly destined to be a girl's vocation. It is clearly suited to girls and its few promotional openings are well adapted to the powers of the small proportion of women who remain permanently in salary-earning work. Nevertheless, for many years our commercial schools have induced, or at least approved, the taking of stenography by boys. The authorities have talked vaguely about "court stenography" to which women have apparently not yet adapted themselves, and about the need of traveling stenographers to accompany business men. But is it known how extensive are these fields? Again, it has been held, vaguely at best, that stenography is a "good stepping stone" for a young man. Much trading has been done on the names of a few noteworthy examples of men who have risen high above their stenographic stepping stones; and, of course, no one questions but that a large proportion of the men who have become salesmen, business executives and the like, once studied, even if they did not, for a wage, practice, stenography. But was such training necessary, or even important, vocational preparation for their subsequent callings, in contrast with what might have been accomplished under more intelligently planned courses?

A further evidence of the unscientific character of commercial courses as usually provided, is found in the length of time assigned to them. The Chinese priest, being asked why pagodas always had fourteen stages, replied—"Pagodas must have fourteen stages." Why should high

school courses be four years in length? Why not three or two years? Is a vocational course of six months in length conceivable for some vocation — *e.g.* that of cash girl, file clerk, or seller of ribbons? But, with the coming of the junior high school, we are threatened with five year courses. They are a "blend" of the cultural, the civic, and the vocational. The keen, well-endowed, well-supported boys and girls who "live through" these courses will probably succeed in whatever vocations they undertake, as have such well-selected and relatively mature persons at all times in the past. But what of the majority who drop by the wayside, forced out by pressing economic needs, or dropping out discouraged by lack of ability?

There are some commercial vocations for which persons under thirty years of age are practically never accepted; and a far greater number for which the age of sixteen is sufficient. Probably stenography has evolved to the point where no one not possessed of "good" native ability, the equivalent of a general education of two years beyond the elementary school, and of substantially twenty-four hundred hours' specific vocational training should be advised to compete. But would it not be absurd to set up similar requirements for a department of indoor salesmanship? On the other hand would not similar requirements be quite inadequate for the vocationally trained "bookkeeper" or, perhaps more accurately, accountant?

It is needless here to discuss the failure, as yet, of most commercial schools, to utilize "productive" work as a means of giving the practical experience essential to the vocational success of those who will not be expected to serve a long apprenticeship on leaving the school. The possibilities of "part-time" connections as means of education for indoor salesmanship are now being seen.

In general, then, it is contended that commercial education is, as yet, vocational in any accurate sense for only a

small proportion of those who take it; and that it can be rendered properly vocational only as a result of thoroughgoing analysis of the scores of commercial vocations for which training is practicable.

Constructive Proposals. — Obviously all constructive proposals for the further development of the various types of commercial education must depend upon sociological analysis of the commercial vocations as now carried on or as they may be expected to be carried on in the near future. On the basis of such examination can be determined, first, the relative efficacy of the non-school vocational education which has heretofore operated; and, second, the practicability and conditions of school vocational education, either basic or extension.

One of the first problems to be solved will be that of accurately descriptive terminology. The census, for example, gives us the category "clerks in stores." Is this blanket term at all helpful? Is it at all practicable to give instruction or training to help persons to become "clerks in stores." Ten minutes' walk down the business street of any city will enable us to see working clerks in: soda water fountains; shoe stores; grocery stores; lumber and coal yards; department store glove counters; hardware stores; and stores for men's clothing. What are their *common* forms of vocational knowledge, skill, or ideal? Would not all attempts to give general commercial training to youths who might embark in these callings practically resolve themselves into solemn talks *about* salesmanship, supplemented by a few bits of specific training in the making of figures, use of cash registers, etc.?

Suppose, however, we had 100 boys of sixteen, all of whom were as desirous and certain of becoming grocers' clerks in small cities as dental students are of becoming practicing dentists; could we not readily devise means to provide at least two years of rich vocational education for

them, on a half-time participation basis, probably on a wage of ten to fifteen cents per hour for 30 hours per week?

In other words it seems probable that we shall have to define "store clerk" vocations more specifically than we have heretofore done, as a basis for working programs. One inevitable consequence of this will be the differentiation of schools according to communities. Not every town could expect to have schools respectively for hardware clerks, drug store clerks (some of whom are, of course, now trained — but not for salesmanship — in schools of pharmacy), shoe store clerks and green grocer's clerks. But within a group of neighboring towns could readily be provided one of each of these forms of schools.

No less difficulty is presented by the use in educational institutions of the word "secretary" as descriptive of the follower of a vocational pursuit. Who is a "secretary"? What are secretarial studies? At what age does a person become a secretary? Are stenography and typewriting primary or secondary accomplishments in the equipment of the young low-priced secretary or the young high-priced secretary or the mature, high-priced executive secretary? Do men and women secretaries usually occupy similar, or very markedly differentiated, fields? Is not the secretarial position, in any strict use of the term, usually a "derivative" or "promotional" position, akin to that of foreman or business manager? If so, may not "post-experience," graduate, "upgrading," or extension education be the most effective means of education for secretaryship? But if a woman desires to complete half or all of a general college course before beginning vocational training, and then, because she desires in the shortest possible space to become a responsible and well-paid secretary — for what program of study, practice, and preliminary employments should she provide? Would it make any difference whether she is to be secretary in a publishing house, a wholesale produce establishment, or the offices of a railway corporation?

Towards the making of secretaries, executives, and the like we have probably overestimated the possibilities of initial vocational education for beginners, and underestimated the possibilities of upgrading or "post-experience" education for selected persons of maturity. Under present conditions perhaps all good secretaries should first have "made good" as stenographers, after which six months or one year of special training would accomplish more probably than several years of technical instruction administered to the novice.

Another group of vocations for which we shall certainly ere long provide vocational education will be that of "traveling (or field) salesmanship." It seems probable that indoor or counter salesmanship will soon be monopolized by women or girls. But field salesmanship may long remain essentially a man's calling.

Many wholesaling and jobbing establishments as well as insurance companies, bond houses, etc., now give their own salesmen a certain amount of technical instruction and training subsequent to a period of apprenticeship in the home office. Such local training is obviously very direct and concrete.

But again we are confronted by problems of "general" vocational education. Certain high schools of commerce now expect a large proportion of their graduates to become field salesmen — of what? They do not know, specifically, so they give them a variety of technical subjects — one or more foreign languages, economics, biology, history of commerce, accounting, stenography, chemistry, commercial law. Does all this constitute vocational education — or is it merely an attempt at general technical instruction in anticipation of vocational education (out of school, probably) to be undertaken when once a job has been found?

The future here also probably lies with much more specific training towards definitely selected vocations, adminis-

tered to students who, in many cases, will probably be required to have obtained in advance not only a reasonable general education, but also one or more years of practical experience in a contributory but essential field. It may prove inadvisable to send a man out as seller of automobiles, woolen cloth, or textbooks until, precedent to specific training for that work, he shall have served as an operative in the automobile factory, an inspector of the woolen goods, or a teacher in the schools.

Finally, it can hardly be doubted that for many types of commercial workers the tendency towards specialization of function, and therefore, of training, at least in initial stages, for it must continue. In many cases we yet require aspirants for the stenographer's vocation to take bookkeeping. Why? Is one stenographer in ten in large cities expected to do anything with bookkeeping? Why should not programs be based upon the actual requirements of the field? A young woman who could prove her competency as stenographer *and* bookkeeper could, of course, command places of special opportunity or need. A few persons who are at once competent in stenography and commercial Spanish are required, especially in seaports, just as are a few dentists or lawyers who know Spanish. Let these *double* vocations be properly analyzed, prepared for, and the followers thereof rewarded as they deserve.

But the commercial market can absorb multitudes of girls and boys who cannot afford to take prolonged preparation. Girls to operate typewriters and dictaphones; boys for messenger service; girls for filing, or for selling specialties; boys for operating calculating machines — thousands of these posts often essentially for juveniles, sometimes for adults, qualified only for routine specialist work are now to be found and their proportion relative to the whole range of commercial vocations is certainly destined to increase. For each of these callings vestibule or upgrading education is no less

possible than is direct education for the trade of stenographer, profession of accountant, or derived calling of executive. Only the addiction of some educators to the prayer wheels of routine will prevent the early recognition of these facts and the provision of means of dealing with them in accordance with sound principles of social economy.

CHAPTER VII

INDUSTRIAL EDUCATION

I

Scope and Specialization. — For the present, in the absence of better classifications, we shall include among the "industrial" vocations all occupations of mining, manufacturing, and transportation, as well as the true handicraft trades such as house carpentry, dressmaking, cigar making, and the like. But certain forms of higher expert service — engineers, analysts, inspectors — as well as the higher executives found in industries will tend to be classified among the professions, as is now the case with civil engineering.

Examination of the census classifications given in Appendix A reveals in part the extensive occupational subdivision of productive processes which is constantly proceeding in the industrial occupations. From the beginnings of recorded history, indeed, there has been increasing subdivision and specialization of the trades. The great extensions of use of power and applied science found in recent decades has enormously increased the number and increasingly differentiated the character of all elaborative and transportation vocations. The classifications used by the census are far short of revealing the actual facts. In every highly developed manufacturing area — the English Midlands, Massachusetts, Westphalia, the Ohio Valley, Japan, Northern France — it is safe to assert that from one to two thousand distinct industrial specializations of service are recognized by employers and employees. Not all of these, of course, have long established standards or distinct labor

organizations. Census enumerators find it convenient to "lump" workers in shoe, cotton, pottery, or munitions factories as "semi-skilled" operatives. As new machines are invented, old occupations give way, and new ones appear, often in great variety.

The evolution of the factory system of production (that is, for elaborative processes chiefly), causes the complete disappearance of ancient handicraft trades in some fields — such as those of shoemaker, weaver, cooper, potter; the partial disappearance of others — tailor, dressmaker, teamster, glass blower, silversmith, compositor; and the profound modification of others — butcher, baker, furniture maker, book binder, jeweler, plumber, brickmaker.

This evolution has affected less the industrial trades involving production of raw materials — mining, lumbering, quarrying — and the building trades, for the reason that operating conditions still force these industries to remain in a measure dispersed. Cotton cloth and even ready-made clothing can be produced in great central establishments; but the production of only some parts of houses — doors, plumbing, and other fixed equipment — can be similarly concentrated. Modern transportation — of ideas (by mail, telegraph and telephone) as well as material commodities — requires a large degree of dispersal of operations; but, nevertheless, railway and boat transportation, as well as telegraphy and telephony have permitted and required very extensive subdivision and specialization of occupations.

Historic Apprenticeship. — Vocational education for many of the handicraft trades was greatly perfected ages ago as apprenticeship. For long periods certain of these trades were "possessed" by hereditary clans. For long periods also they were held by guilds which were given monopolies, and which standardized and evolved the skills and "mysteries" involved. From the sociological point of view it is evident that apprenticeship was a natural and, under normal

conditions, effective, method of vocational training where production was so dispersed that men worked almost one by one. "Man and helper" would thus naturally develop close relationships. The opportunities for the learner to "copy" the craft of the elder "master" would be innumerable. A period of journeymanship — experience in working with craftsmen at a distance from the home town — would naturally offset the effects of excessive "inbreeding." Even when the making of special types of cloth, armor, pottery, jewelry, and saddlery were, in the Middle Ages, concentrated in certain cities, it would appear that production was still carried on largely in individual small shops, often consisting only of the master and his "apprentice" (who frequently "lived in" and, in popular romance, eventually married the daughter of his master) working in rooms adjoining or even constituting a part of the residence.

The progressive impairment and disappearance of apprenticeship education has inevitably followed the changing of conditions of production. Apprenticeship has little chance where workers are aggregated. Specialization of routine service will inevitably take place. Furthermore, apprenticeship seems to belong best to those stages in economic evolution when methods of production have become a true practical art, but have not reached the stage when "applied science" can be said to control. The making, as well as the working into serviceable tools, of iron and steel were "arts" long before the scientific principles underlying the processes were understood as in modern metallurgy. In the language of the time, they were "mysteries." Imitation, prolonged and painstaking, was the necessary method of learning. There were no direct and speedy ways to the acquisition of skills, and "technical knowledge" consisted chiefly of traditions.

The naïve assumption is sometimes made by amateur economists and sociologists that men work or should work

"for the joy of working"; but this, of course, is an assumption of artistic romanticism and of impractically idealistic philosophies. Men "work" now as they always have "worked" primarily to produce enough utilities wherewith to sustain an approved standard of living. Doubtless all persons are in greater or less degree endowed with "play" instincts which evolve in some individuals to the point that, at maturity, gives us the creative artist, inventor, explorer, or entertainer. But it is doubtful use of language to call these efforts "work" in the sense that the term is generally employed to designate the endless routine, body-straining processes whereby men provide for needs of food, shelter, defense, movement, health, learning, worship, and justice.

It is possible that men of the temperate and frigid zones have so long worked that certain ill-defined instincts have been "acquired" (*pace* the biologist) which render the individual unhappy if he be given no opportunity to develop them. (Few men would contend that races long resident in the tropics have any such insistent instincts.) It is also certain that, given a long period of habituation to regular and absorbing work (*e.g.* between the ages of twelve and thirty), an individual is likely to be unhappy thereafter if deprived of opportunity to go on with his favorite employment.

But these are variant and derivative conditions. The fundamental sociological as well as psychological fact is that men work to produce, first the necessities, then the ardently desired luxuries of life, and they are always bent on doing this in the most expeditious way possible. If combination of effort will give better results in terms of exchangeable goods than individualized effort, then sooner or later, and beset by the many vicissitudes involved in learning new customs, we shall find men working in aggregates or companies. If the increased harnessing of natural powers will help towards the same end, then we may expect wind and water, steam and gas to be used instead of man and animal power.

Hence a certain inevitability has characterized modern industrial evolution. Development of facilities for transportation has made profitable territorial specialization of production. Brazil specializes in coffee and rubber; the American Western Plateau in cattle; Florida and California in fruit; Pennsylvania and Westphalia in coal and iron; Michigan and Washington in lumber products. Localities which have started on certain types of factory production localize and specialize along these lines, giving us regions of specialized manufacture like Connecticut, Manchester, Lille-Roubaix, and Detroit.

Under these conditions, nearly all old forms of apprenticeship education have given way. In those trades that still retain features of handicraft production — plumbing, printing, dressmaking — survivals of apprenticeship still persist. In a few modern occupations — of which perhaps locomotive engineering is the best example — new types of apprenticeship, sometimes apparently very effective, have developed. But, in general, modern manufacturing knows little of apprenticeship; modern transportation presents a few new forms only, while the building trades retain not a few survivals, but for which the supplementing aid of trade schools is being increasingly asked. Printing, machine shop work (iron and steel chiefly), and a few ancillary trades such as pattern making, molding, and station electrical work retain or have developed forms of more or less organized apprenticeship education, and these are the fields in which some significant trade school education has evolved.

Trade School Education. — In appraising modern developments of basic industrial education certain fundamental facts must be remembered: (*a*) Educational as well as popular opinion has chiefly interpreted industrial education as "trade" education. Factory, mining, and transportation pursuits have obviously been followed in large part by what

ill-informed opinion denominates "unskilled" workers, and which census enumerators, with hardly more accuracy, classify as "semi-skilled" operatives. The trades, therefore, have constituted the aristocracy of the industrial occupations. The public vocational school has been either too restricted or too inefficient to serve as a satisfactory means of access to them thus far.

(*b*) The introduction of manual training has been approved by the public because of vague convictions that somehow it would give basic, or at any rate rudimentary, trade training. Manual training found its chief available openings in woodworking, with metal working and printing in remote second place, and leather and clay working as occasional suggestions. The earlier technical schools for boys found the transition from laboratory to certain forms of shop work in electricity not difficult. Hence, when it was perceived by school authorities that something more substantial than manual training was needed to meet popular demands for vocational training for the industrial occupations it was natural that the going forms of manual training should furnish the chief source of working suggestions as well as, not infrequently, teachers and equipment. But, necessarily, these were in the already tested fields. Woodworking, as an indoor vocation, became "cabinet-making," notwithstanding that the cabinet-maker's trade (as a handicraft) is nearly extinct in America. Electrical work took the direction of indoor wiring. Some brave transitions from machine woodworking, to "turning" and "pattern-making" were tried until it was realized what a small demand existed in modern industry for specialists in these fields. Machine metal working and printing developed more realistic work, although even here existing trade schools are still greatly wanting in standards of performance, a condition which is indicated by the indeterminateness of their connections with apprenticeship and operative specialties.

(*c*) Philanthropy, interested in providing for boys and girls deprived of their natural protectors, first pioneered the way in the establishment of trade schools. In a few cases, even of schools established many years ago, standards were reasonably definite and practical. But publicly supported industrial schools have seldom become more than half-developed technical schools — that is, schools imparting information *about* one or more trades, but giving little practical training *in* its processes. As in the case of other types of vocational schools — agricultural, commercial, home-making, and even, as stated elsewhere, professional — the general educator thinks of vocational competency chiefly in terms of knowledge. He desires to leave to non-school agencies the imparting of skill, of which, it would often seem, he has a low opinion at best.

It is from the basis of the foregoing considerations that we must study and appraise contemporary efforts looking to basic school industrial education. Existing day schools have been severely handicapped by tradition; their promoters have seldom faced the realities of modern industrial evolution; they have never known just how far they ought to go in giving direct vocational education, rather than some mystic "general" or "indirect" vocational instruction; and they have never been quite clear as to what portions of a rounded vocational education they should be responsible for. The well-informed reader will recall a few, but only a few, noteworthy exceptions to the foregoing characterizations. One of the most needed works of research and survey now is an evaluative investigation of existing private and public day industrial schools.

Evening Industrial Schools. — Evening industrial schools for extension education have rarely extended to other fields of operation than day schools attempting basic education. Naturally their extension courses have dealt with *related* technical subjects rather than with practical training. How-

ever imperfect their methods, they have been in results probably fairly effective means of technical instruction for those trades that increasingly require the interpretations and supplementings of applied science, art, and mathematics, since their instruction is in greater or less degree correlated with, and, in the few really good courses, actually integrated into, the practical experience being gained by the learner from day to day in productive work.

Historically, several impediments have been encountered in the development of evening extension industrial education. (*a*) Intellectual energies are in most people at low ebb after a ten or even an eight hour working day, even in occupations involving much routine. (*b*) Evening school courses have usually been general in their nature and in rare cases only, at all closely correlated with practical experience obtained in apprenticeship or factory participation. (*c*) Teachers could not be trained for, or even primarily employed for, evening school instruction. (*d*) Little could be done in the way of systematic supervision of evening school-teaching or in the preparation of courses for it.

The shortening of the working day is probably helping solve the problem of the fagged student. Recent legislation tends to deny to students under 17 or even 18 years of age admission to evening classes. But it is probable that for many workers, nature itself has created persistent barriers against obtaining satisfactory results from night school attendance. For young workers short course or part time training will be the line most effective in the future; while for mature workers short course and "dull season" full time "upgrading" instruction on the one hand, and correspondence and other "self help" forms of extension education on the other, will be found capable of almost indefinite development.

Decided progress has been made in recent years towards the "short unit" extension course as the basic factor in

evening instruction. The short unit is pedagogically adapted to the usual type of evening school student; more than the general, and often severely logical, "long course," which was too often designed to insure mastery of a scheme of "principles," it is capable of being correlated with the actual experience of the learner — if not consciously by the teacher, at least partially by the efforts of the learner himself. Large opportunities still exist for creating out of all possible evening school students in a given area groups fairly homogeneous as respects development and occupations being followed and for providing them with courses of "short unit" instruction which will definitely and visibly reinforce their vocational competency. But one of the largest opportunities for effective work in this field is still largely unrecognized by educators — namely, the union of the methods of direct evening school instruction with those of correspondence school instruction in order to devise a new type of presentation having the merits of each and the defects of neither. If, for example, a young mechanic is prepared to give to extension work in related drawing the equivalent of twenty winter weeks, a short unit assignment could be made to him in a pamphlet of fifteen or twenty pages containing detailed and explicit directions and problems for work. An average of two hours each two weeks could be required for conference with the instructor and the presentation of work accomplished. These conferences could be arranged for groups or for individuals. It should be remembered that a fundamental, if not the primary, object of extension education is to render the individual increasingly capable of relying upon himself in advancing his powers over his vocation. Evening school instruction as now organized seeks that end purposefully even to a less extent than day school instruction. Obviously such procedure is very expensive and often of doubtful value. Correspondence instruction, on the other hand, is valuable in that it

throws the learner constantly back upon his own efforts; but the absence of personal contact discourages the large majority who take it.

The provision of specially qualified teachers and supervisors presents endless difficulties at present when basic day school education is so imperfectly developed. But if, as may well be surmised, short course day schools of industrial education greatly increase in the near future, it will be readily practicable to provide plans for the utilization of properly qualified teachers in both day and evening schools.

Continuation Schools. — In current plans for the reorganization of public education in France and England the most far-reaching proposals are those which contemplate requiring continuation school attendance up to 18 years of age. It is well known that in the educationally more progressive states of Germany — Saxony, Würtemberg, and Bavaria, among others — continuation school attendance up to 16 or 17 and, in a few cases, 18 years of age has been obligatory; while in less progressive Prussia some beginnings had also been made before 1914.

In America continuation school attendance is now (Jan., 1919) compulsory in Wisconsin and Pennsylvania, in Boston and in one or two cities in Ohio. In several states continuation school bills are being drawn for presentation to the pending legislatures. In many respects the continuation school is one of the most actively developing forms of education, if not in practice, at least in theory.

There still exist, however, many misconceptions regarding the possibilities of continuation schools. How far can the continuation school actually contribute to vocational competency? Frank examination of this question, in the light of such knowledge as is currently available, is always desirable. The following findings, stated dogmatically for the sake of brevity, express the writer's present convictions, formed after some years of study of, and experience with, continuation school work:

1. It is entirely in accordance with sound public policy that the compulsory full-time attendance of children in day schools up to the age of 14 should be supplemented by compulsory part-time or continuation school attendance up to 16 or preferably 18. We may therefore expect all states, in proportion to their educational progressiveness, to enact compulsory continuation school legislation during the next few years.

2. The essence of the continuation school lies in two facts: that attendance is within the ordinary working day; and that attendance is obligatory on all persons of specific ages not otherwise attending schools. Hence, in the true meaning of terms, evening schools or other out-of-working hours schools are not continuation schools; and no effective results can be achieved, practically, from voluntary continuation school attendance except within single establishments employing very large numbers.

3. The *aims* of the continuation school education may be vocational, or general. In every case it is peculiarly important for this type of school that aims, purposes, or objectives, be clearly defined, and with reference to particular groups of pupils. The aims for girls will differ from those for boys; the aims for retarded pupils will differ from those for bright pupils; the aims for the healthy will differ from those for the unhealthy; the aims for those employed in the factory callings cannot be the same as those for the mercantile callings.

4. The *general* education offered at any given time in the continuation school may be chiefly designed to make up for deficiencies of previous general education; or to add new contributions along special and novel fields. For the time being it may confine itself chiefly to the department of *physical* education or to *social* (civic and moral) education, or to *cultural* education.

5. Vocational education given in the continuation school

may be either *basic* or *extension,* according as it is designed to teach a new occupation or to advance the learner in the occupation he is already following.

6. Opportunities to give genuine basic vocational education on a continuation school basis between the years of 14 and 16 will probably be found to be few. Between the ages of 16 and 18 better results may possibly be had in manufacturing and commercial centers, especially if attendance of from 8 to 15 hours per week can be assured.

7. Opportunities to give *extension* vocational education at any age will obviously depend upon the wage-earning employments being followed by the young workers. In such fields of work as agriculture, salesmanship, office work, and the handicrafts, the opportunities should be good. In the factory callings where the young workers serve chiefly as operative specialists or helpers, the opportunities are probably not good (although the whole matter is much in need of investigation).

8. In general, it is not to be expected that the continuation school by itself can solve the problems of vocational education for children from 14 to 16 years of age. But it can do much, if properly handled, to develop and improve their cultural and civic education, especially because its pupils are, during part of their time receiving the very real and helpful education of contact with the actualities of life in wage-earning work.

9. The *ideal* plan for the continuation school designed for workers in highly organized fields of production — factories, department stores, etc. — is such as will permit the workers to give *half* of adult working time to wage-earning employment — thereby making double shifts of young workers possible. Juvenile workers could be debarred from working more than five hours per day, or thirty hours a week; and, concurrently, be required to attend school at least three hours a day or fifteen hours a week.

10. Continuation school education can be made valuable only by providing *specially adjusted courses of study and specially selected and trained teachers.* If we do not provide these, the time spent in schools by pupils will be a time of profitless boredom or of holiday mischief-making, according to the severity of the disciplinary methods employed.

11. By specially adjusted courses of study, in general or in vocational education, is meant, in part, *short unit courses,* focusing upon objectives of achievement easily comprehensible to the pupil and capable of being consciously related by him to his needs, deficiencies, or interests; and, in part, adapted courses, permitting such methods of treatment as will relate the materials and ends to the learner's outside experience, vocational or non-vocational.

12. Probably young teachers should never be employed in continuation schools. These should be promotional positions, presupposing maturity, selection for special fitness, and a short course of professional training — possibly 100 hours of extension study, or 180 hours, six weeks, of six hour a day special preparation.

13. In administrative charge of continuation schools in state and municipality, where practicable, should be a special administrator aided by special supervisors, qualified to do experimental work as well as to perpetuate routine performance.

II

The War's Effects on Industrial Education. — It is often said that modern war is essentially an engineering enterprise. But to an unprecedented extent the Great War was likewise a manufacturing and transportation enterprise. At any given time fully as many workers were exclusively employed in war work in the "second" (transportation and supply) and "third" (production) lines of defense as in the strictly aggressive enterprises at the front.

It was therefore to be expected that in the hurried and far-flung preparation for war which the United States was obliged to make, much experience both as to the needs and as to the processes of industrial education should have been developed. The following are submitted as tentative findings in the subject:

1. The war did nothing to abate society's faith in the need of publicly supported and publicly controlled vocational education. In numerous ways it accentuated the need and revealed the possibilities of special forms of that education. For success in war, for success in state building, for the furtherance of efficient democracy, it has become increasingly clear that peoples who are to advance in the struggle for survival and for worthy social achievement must have more and better vocational education than ever before. That can be had only through coöperative effort — probably only through state support and state control, as are now accepted policies for various grades of cultural and civic education.

2. As a means of playing its part in the war America embarked on vocational and especially on industrial education on an heroic scale. Every cantonment became in effect a gigantic boarding school designed to train men for the temporary vocations of war. Officers' training camps trained thousands of men for war leadership often by means of courses only a few months in length. In shipyards and munitions factories, the government promoted the establishment of hundreds of special classes to train men and women for new vocations in turning out the standardized implements used directly or indirectly in martial operations. The government used existing schools of engineering and industrial education to train in short intensive courses thousands of specialists for sustaining service to the army and navy. It sent hundreds of thousands of young men, not yet old enough for active service, to colleges and schools of

general and vocational education, where it designed to fit them for early military service as officers or technical specialists. It encouraged manufacturers to establish "vestibule," "upgrading," and other training department schools within factories, as a means of making trained labor out of untrained labor volunteers.

3. **Economic Tendencies.** — The demands of the war contributed to the clearing up of some matters in the economic world. War obviously intensifies consumption of some familiar kinds; but it also creates new demands upon an enormous scale. For this war America needed large quantities of wheat, sugar, woolen goods, castor oil, tin cups, binoculars, and surgical bandages. We were forced to produce enormous quantities of rifles, aeroplanes, motor trucks, shells, gas masks, carbolic acid, explosives, and wrist watches. In all these fields the pressure has been constant for quantity production of standardized parts or commodities. America's business preparedness for quantity production was, from the start, good; and such success as we achieved in the war is to be attributed more to our capacity for large scale work than to any other one factor. As a people we utilize mechanical power to perform work, instead of hand power, wherever possible. As a people we prefer wholesale production to retail. We take kindly to expensive and complicated machines if they will bear the burdens of large production, if they can "deliver the goods." We pride ourselves on our "big things"— ships, cars, mines, buildings, factories, schools. We like to see operations carried out on a large scale, part coördinating smoothly with part. And where we could move toward, or in war on, a huge scale, in an efficient manner, we have had confidence in the outcome.

4. But the very success of all this in war, undoubtedly means for the future greater use of capital, mechanical appliances, large scale output and subdivision of process in industry, commerce, agriculture, and even in many of the

professions. It means the accelerated decline of handicraft production, the "all-round" trades, historic apprenticeship, economic individualism, the "practical arts." It involves progressively the vocational (but not cultural or civic) specialization of the inventor, the manager, the foreman, the inspector, and even the routine worker himself. It suggests the importance of a "selective service" for each large establishment, the use of scientific methods in employment, "upgrading," transfer and dismissal of workers. It certainly greatly complicates the problems of vocational education of all kinds. It is to be feared that it presents a discouraging outlook to those who seek, as they think, to revive or to develop the "creative impulse" of an historic type, although it no less surely opens up to all workers opportunities for culture and civic usefulness of kinds heretofore unsuspected in industry. It throws a heavy burden of proof upon those who would see our industrial system fundamentally transformed, in face of rapidly increasing population, rising standards of living, demands for increased leisure, and diminishing natural resources.

5. For it is much to be doubted if we can reverse present tendencies of economic evolution. We can search out and prevent some of their pathologic effects on human beings, for pathologic effects they certainly have, as have had all other social and economic transitions since men first emerged from the woods of our primate ancestors and began to build fires, invent tools, wear clothes, and employ speech. If the harnessing of the natural forces of wind, water, steam, electricity, and exploding gas means that man can produce the maximum of goods by organizing such mechanisms as will enable him to bring water by turning a spigot, light his buildings by turning a button, draw his trains by sitting at a lever, plow the earth from the vantage of a comfortable seat, cut coal with a power driven chain-saw, or weave cloth with a battery of automatic stop looms, then certainly large

numbers of our future workers will, during their working hours, be, in the best sense of the word, machine tenders, although outside of working hours we hope that they will be cultivated men and women, interested in matters of personal development and civic usefulness. It may be, indeed, that as a means of achieving the maximum of social growth, we shall not in the future have our youth begin on specialized productive work until mature years have been reached, that we shall all work in gainful routine employment but a few hours each day, and that outside of hours devoted to production we shall engage ourselves as amateurs in response to ancient instincts of workmanship and invention. But we shall not expect back-yard gardening to supply even in small part the world's demands for wheat, beef, sugar, rubber, cotton, and milk. We shall encourage amateur craftsmen in all their hobbies for the sake of the personal development these afford, but without seriously expecting them to minister to the world's gigantic demands for cotton cloth, ships, paper, printed matter, picture films, canned fruits, furniture, cars, or transportation. We are probably destined to see our Chinas and Indias following in the wake of the western world in their efforts to stave off hunger, disease, and other concomitants of low productivity, by means of large scale production. If one of the effects of social evolution — accompanying less frequent wars, diminished disease, new inventions, intensive cultivation — is a steadily increasing population and another is rising standards of living, then it is certain that old methods of production will not suffice. In spite of the regrets and misgivings of the conservatives we must expect increased use of machinery, larger use of the capital that machine production requires, greater regimentation — self initiated and democratic, we hope — of workers, greater subdivision of productive process, and greater specialization of operatives from industrial general to workshop private. But we have also a right to expect

from it more democracy, more prosperity, greater spiritual possessions. William Vaughan Moody thinks of "industrialism" as a brute, which, untamed and destructive at first, must be domesticated to man's uses:

THE BRUTE [1]

Through his might men work their wills.
They have boweled out the hills
For food to keep him toiling in the cages they have wrought;
And they fling him, hour by hour,
Limbs of men to give him power;
Brains of men to give him cunning; and for dainties to devour
Children's souls, the little worth; hearts of women, cheaply bought:
He takes them and he breaks them, but he gives them scanty thought.

For about the noisy land,
Roaring, quivering 'neath his hand,
His thoughts brood fierce and sullen or laugh in lust of pride
O'er the stubborn things that he
Breaks to dust and brings to be.
Some he mightily establishes, some flings down utterly.
There is thunder in his stride, nothing ancient can abide,
When he hales the hills together and bridles up the tide.

They who caught and bound him tight
Laughed exultant at his might,
Saying, "Now behold, the good time comes for the weariest and the least!
We will use this lusty knave:
No more need for men to slave;
We may rise and look about us and have knowledge ere the grave."
But the Brute said in his breast, "Till the mills I grind have ceased,
The riches shall be dust of dust, dry ashes be the feast.

"On the strong and cunning few
Cynic favors I will strew;
I will stuff their maw with overplus until their spirit dies;
From the patient and the low
I will take the joys they know;
They shall hunger after vanities and still an-hungered go.
Madness shall be on the people, ghastly jealousies arise;
Brother's blood shall cry on brother up the dead and empty skies."

[1] Quoted from the collected poems of Wm. Vaughan Moody by permission of the publishers, Houghton Mifflin Co., Boston.

So he plotted in his rage:
So he deals it, age by age.
But even as he roared his curse a still small Voice befell;
Lo, a still and pleasant voice bade them none the less rejoice,
For the Brute must bring the good time on; he has no other choice.
He may struggle, sweat, and yell, but he knows exceeding well
He must work them out salvation ere they send him back to hell.

All the desert that he made
He must treble bless with shade,
In primal wastes set precious seed of rapture and of pain;
All the strongholds that he built
For the powers of greed and guilt —
He must strew their bastions down the sea and choke their towers with silt;
He must make the temples clean for the gods to come again,
And shift the lordly cities under skies without a stain.

In a very cunning tether
He must lead the tyrant weather;
He must loose the curse of Adam from the worn neck of the race;
He must cast out hate and fear,
Dry away each fruitless tear,
And make the fruitful tears to gush from the deep heart and clear.
He must give each man his portion, each his pride and worthy place;
He must batter down the arrogant and lift the weary face,
On each vile mouth set purity, on each low forehead grace.

6. **Education for Specialized Industries.** — What does all this mean to education, vocational and general? In the first place it clearly indicates the need of all the vital effective general education — cultural and civic — that we can secure on behalf of all our citizens, in order that they may appreciate, understand and control the very complex economic and political conditions under which civilization in the future is to advance and be conserved.

Much of the training and instruction now given in the grades is very imperfectly functional for modern conditions, and it is the writer's conviction that most of the offerings of the high school are almost valueless from the standpoint of the cultural and civic requirements of to-day.

For all our pupils we need to extend and enrich opportunities for cultural, civic, and physical education. By all feasible means we must induce our young people to remain in full time, continuation or evening extension schools as long as they can profit from them. Even now nearly half our young people in more advanced communities are remaining in schools of general education until sixteen years of age. The proportion of the population remaining in full time schools, the primary purposes of which are civic and cultural education, is steadily rising throughout America. And the day is not far off when we can require continuation school attendance up to eighteen years of age, partly as a means of preparing our citizens for the larger civic responsibilities they must carry in the future. As respects vocational education, impending changes accelerated by the war will unquestionably be of a sweeping character. We are now learning the futility of manual training, mechanical drawing, bookkeeping, shop mathematics, textbook agriculture, and laboratory home economics as means of preparation for the great majority of vocations, however valuable factors they may be in general education. Even our best trade schools — of dressmaking, plumbing, carpentry, millinery, electrical installation, machine-shop practice and printing — feel themselves continually balked by the dissolving processes taking place within the historic vocations for which they seek to give training. Our schools (not the colleges) of agriculture succeed with extension vocational education chiefly, and have only in rare instances learned to give basic vocational agricultural education, even when they know whether they have the skilled "hired man," the tenant, or the owning farmer in view as the product of their training. We are not satisfied with our commercial schools which offer vocational education for only two out of possible scores of vocations. As for our dominant factory callings — those which produce our lumber, furniture, cloth, guns, shoes,

tools, machinery, packed foods, drugs, jewelry, books, newspapers, clothes, ships, sugar, flour, etc. — we had made hardly a pretense of offering vocational training for them until forced by the emergencies born of the war. Clearly we must forge ahead, learning more about vocational education adapted to modern conditions.

7. **Vestibule and Upgrading Schools.** — We have not yet seriously faced the problem of providing vocational education for those specialized agencies of production that were so largely instrumental in helping win the war. The vestibule and upgrading schools rapidly developed in factories for war supplies when the United States Employment Service stopped the free migration of workers, suggest many possibilities. These may be inferred from an imaginary description of a large plant with highly subdivided operative processes.

Let us imagine to ourselves a great manufacturing concern employing 20,000 workers ranging from managers and scientists at salaries of from $5,000 to $25,000, through foremen and inspectors earning from $2,000 to $4,000 per year, skilled men at from $1,200 to $2,000, and down to operatives, in many cases girls and boys from sixteen to twenty years of age, earning from $400 for the juvenile employees to $800 to $1,200 for those of greater maturity, experience, skill, and technical knowledge.

Because of its organization, use of science and modern machinery, magnitude and favorable location, we are justified in assuming this establishment can produce goods of approved quality at relatively low cost. We may also assume that partly as the effects of legislation and partly as outcome of advanced standards, voluntarily accepted by employees and employers, this factory maintains approved conditions of lighting, hygiene, hours of labor, use of safety devices, etc.

For the purpose of recruiting labor — from the most to

the least expert — the concern possesses an employment department which, by means of carefully devised tests, ascertains the probable serviceability of all those seeking work. Supplementing this employment department are training departments in which beginners or more mature workers ready for advancement are given a few days or a few weeks training on productive work in some simple operating specialty, receiving in the meantime an agreed upon proportion of the wage for a full-responsibility worker in that department or operation. If the worker comes to the factory with previous experience, he will naturally be assigned to that department for full productive work or for further training in which he can render the best of productive service for himself and for the establishment, according to his experience and maturity.

Let us assume the cases of several boys of sixteen entering the work of this factory for the first time. In the light of our present knowledge and control of economic and educational conditions what could be done to insure best opportunities for these boys in their vocational evolution? It is to be assumed that in a factory of the magnitude here described there are many kinds of work and many grades of compensation, and that the boys themselves will vary materially as to their potential powers and future possibilities.

Before the boys begin to work, they are tested. They are employed for departments using large numbers of juvenile workers, sometimes as operating specialists. Before beginning "full responsibility" work they are sent on half wages to a training department (for their specialties). Here, working full time, and on jobs that are similar to those they are later to undertake, they receive intensive training for three days, three weeks, or three months, depending on the difficulties of the processes they are to undertake and on their own learning powers. In the training departments, the primary educational processes will usually be

training for skill — for accuracy, speed, safe action, etc., since production by harnessed powers requires this first of all. But in so far as technical knowledge can be related to, or is in any way required in, the productive processes it also will be given. Lectures and reading matter will likewise be given to the learner to enlighten him as to the purposes, social significance, organization, and evolution of the great economic structure of which he has become a living part. Other reading and lectures will enlighten him as to his future personal opportunities in the plant. By yet other means he will be informed as to organizations formed by workers for self-help, advancement of their calling, coöperative participation in administration, etc.

Our young workers, after a period spent in "vestibule" schools, will then become full-fledged wage-earners, but, of course, on what are still essentially juvenile occupations. The more capable and ambitious of these boys will, however, soon desire advancement to more difficult and better paying work. For them are provided "upgrading" schools or departments. Like the vestibule schools for beginners, these "upgrading" schools offer, usually, short intensive courses of training for advanced specialties. Pupils for these are recruited from the more promising workers on simpler and less well-paid processes.

Given opportunities of the kind here suggested, we are justified in assuming that the more ambitious and gifted boys will push on from level to level. As they reach twenty-two to thirty years of age some of them will become aware of their possession of natural powers of leadership. They will see possibilities of becoming foremen, inspectors, managers, inventors, technical specialists. They will attend special upgrading schools, correspondence schools, or else take a year or two off to go to a technical school or college in the field of their special interest.

The boys to whom nature has been niggardly of gifts

cannot, of course, rise to these heights. But neither can they remain too long in the juvenile operative specialties or those in which they will have to compete with girls or young, unmarried men workers. Sooner or later they must utilize the upgrading school to reach operations offering compensation sufficient to support a family. Even when they have reached such a specialty many of them may be expected to take training for other specialties in order to avoid ruts, to have, in time of change, more than one arrow in their quivers.

Is not the plan of vocational education here suggested the only one that will assist our workers in modern highly specialized productive enterprises? Is it not the only one adapted to factories for textiles, locomotives, firearms, jewelry, clothing, furniture, packed meats, books, newspapers, automobiles, shoes, stoves, and buttons? Is it not the only one adapted to commercial education for department stores, large banks, commission houses, large offices? May not something analogous to it be the best means of training young men for the successive farming stages of skilled farm hand, tenant farmer on a major and two minor specialties, and finally owning farmer?

8. It is sometimes questioned whether, outside of wartime, vocational education of the kind here mentioned should be supported at public expense. Some unthinking people complain that it benefits only employers. They say, "let industry train its own workers." But they fail to realize that good training of physicians benefits all of us, since we are likewise private employers of physicians. Good training of any sort benefits us or our representatives as employers, and also as employees. But, complain the unreflecting, the employer gets all the benefit. How is this possible so long as there are varying wage scales within a given factory and workers, after training, come into the higher scales? For the present we have to assume the operation of laws of

supply and demand in fixing shares of the worker's product that are to go, respectively, to interest on investment, depreciation of plant, overhead charges, profits of enterprisers, and wages. Like the law of gravity, the law of supply and demand is always operative, always limiting. We can, on occasion, and for a time, offset gravity, but only by special machinery and at cost of great outlay of energy. Similarly, in the family group, in an army group, and under some other conditions, like monopoly or illegal oppression, we can offset temporarily the pressure of the law of supply and demand. But we can never stray far from it except with very special machinery and with great cost to somebody.

Problems of Vocational Education for Highly Specialized Vocations. — The following are some of the essential conditions to be included in consideration of problems of vocational education for the specialized callings:

1. Many processes will be found for which very young or only slightly competent adult workers are adequate, and for which a few hours', or at most a few days', special vocational training will probably suffice. In these occupations juvenile and women workers are apt to predominate.

2. Opposed to these will be processes which require special qualities of bodily strength, maturity, experience, judgment, training, technical knowledge. Men engaging in the work as a life career will be found more numerous in these specialties where requirements are more varied and compensation higher.

3. Some of the more scientific specialties will require workers of advanced technical education. In many cases these places cannot be filled by promotion from among the workers of an industrial establishment, but will seek specially prepared workers — engineers, draftsmen, assayers, accountants, inspectors, designers — from persons who have had specific vocational school training.

4. On the other hand, many of the advanced positions

will require qualities that can probably be most advantageously found within the establishment itself, among those workers who have been adding to their natural physical and mental qualifications for such work, the special training or technical knowledge required.

5. In any highly organized establishment a variety of forces operate to keep a specialty worker on one type of job, except when pressing need exists for workers to fill higher places. Only in relatively few cases — like the advancement of locomotive fireman to freight locomotive engineer, and from freight locomotive engineer to passenger locomotive engineer — does there exist a regular and expected line of promotion. Hence, if for reasons of individual or social efficiency, it seems desirable that workers should be encouraged and assisted to seek promotion wherever and whenever practicable, special forces of an educational nature must be set in motion.

6. In highly specialized fields of production it will often be easily possible to train a worker to perform special types of operations of approximately the same difficulty and involving the same compensation — horizontally specialized occupations. It is very probable that the shifting of young workers among several of these occupations may prove of great importance from the standpoint of growth in body and mind. It may yet be demonstrated that shifting from one occupation to another will prove of great advantage in relieving the monotony of specialized work.

7. Promotion from inferior to superior occupations now prevails in greater or less degree in all occupational fields, since it is evident that higher places are filled, and demands for service there are only slightly more pressing than below; but that promotion is now badly organized, wasteful, and ineffective generally. But no initial vocational education can provide for it; that must be met by special schools of basic or of extension vocational education designed to be avail-

able when the worker shall have reached the approximate stage of maturity and experience requisite for the proposed advanced stage, and when proper vocational guidance tests will have demonstrated his probable qualifications for the different or advanced calling.

8. In many cases promotion will involve simply advancement to a process related to, but somewhat more exacting, than the one previously followed. In such instances the possibilities of acquiring suitable training in day continuation and evening extension schools and classes should always be examined.

9. But when promotion involves shifting to an occupation for which the old gives little direct preparation, then it is doubtful whether continuation or extension school attendance will suffice to give the needed preparation. Probably short-course schools designed to give basic training, followed by part-time wage-earning participation will give best results.

CHAPTER VIII

VOCATIONAL HOMEMAKING EDUCATION

The education of women and girls for the homemaking vocations has evolved only to a point where a number of specific problems can be diagnosed. It is the purpose of this chapter to state a few of these problems, to suggest some methods for their further study, and to submit certain tentative proposals for criticism. As far as practicable, the methods employed will be those being developed in educational sociology, namely, to base all proposed aims of education upon an analysis and evaluation of those needs of social groups which are to be realized in and through education, school and non-school. The standards will be those increasingly accepted in the general theory of vocational education. The study is designed primarily for educators engaged in research in the fields of homemaking and household arts education, or in administering state and national legislation intended to promote such education.

I. Problems for Consideration

1. Do we possess as yet any definitions of the homemaking vocations sufficiently specific and concrete to serve as foundations for the formulation of satisfactory programs of instruction and training for those vocations? Where can they be found? (It is obvious that definitions expressed only in vague general terms render very poor service.)

2. Back of definitions of homemaking, do we as yet possess analyses and classifications of *homes* sufficiently con-

crete to enable us to determine what are, for given social groups and conditions, optimum degrees of efficiency to be expected of homemakers? (For example, the criticism is often heard that existing programs of home economics education are based on excessively high home maintenance standards from the standpoint of those whom they are to serve — that they ignore the $900–$1200 income class home, in spite of its prevalence.) [1] Where can such analyses be found?

3. Have we as yet any sufficient survey of the effectiveness of the non-school vocational education for homemaking which now prevails (and always has prevailed, possibly in different forms) in various social groups or income levels? Where can the results of such surveys be found? (It is alleged that programs of basic home economics education now take no adequate account of the effectiveness of non-school education, and therefore fail to utilize its results, coöperatively or as basis of correlation.) What, for specified groups or conditions, are the contributions of such education to (*a*) ideals and appreciations, (*b*) technical knowledge, and (*c*) skills, at age levels, 1–12, 12–15, 15–18 for non-wage-earners or school attendants, (*d*) 15–18 for wage-earners or school attendants, (*e*) 18–22 for home "boarders," (*f*) 18–22 for home assistants, and (*g*) 22–30 for young married women, etc.?

4. Is it practicable to distinguish in the actual exercise of the homemaking vocation by given individuals the factors, respectively, of "skills," forms of "related technical knowledge," and forms of "related hygienic, social, and cultural knowledge (and ideals)" in such a way as to deduce therefrom the best parts which should be played respectively by home apprenticeship, school education, and undirected experience, in the total educative processes of producing vocational competency? (Home economics

[1] Incomes and prices herein are supposed to be as of 1914 standards.

classes and courses have heretofore restricted themselves largely to *technical instruction;* they seem to have done little to produce the two classes of skills essential in homemaking — manipulative and managerial; and both their methods and results have been freely criticized as "impractical," "over-technical," "excessively wedded to book and laboratory"). Under what conditions can technical instruction alone function in vocational competency — (*a*) as instruction unconnected with home experience for girls 12–16 under conditions of home apprenticeship, (*b*) as instruction uncorrelated with home experience on part of girls 16–20, (*c*) as extension instruction to housewives? Does Bulletin 28 of the Federal Board for Vocational Education definitely provide for "training"? How can training in "homemaking arts" be given? Have we as yet any satisfactory analyses of "training" for homemaking at ages 12–14, 14–16, 16–20, before marriage, after marriage?

5. In general, it is agreed that the best time for vocational education is just prior to the individual's undertaking "full responsibility" work as operative or manager in the vocation itself. When do the following persons usually undertake "full" or "part" responsibility work: farmers' daughters not leaving home until married; domestic servants; women wage-earners from 16 to 23, then marrying and discontinuing outside work; home-staying daughters? How far are girls exceptions to above principle by virtue of constant living in homes? How far do girls at 14–16 possess active motives for entry upon vocational homemaking? How far can results of homemaking instruction or training keep in "cold storage" (without application), *e.g.,* in cases of girls 16–22 working for wages, but living at home? How far can "instincts" for homemaking contribute to expected proficiencies — along food lines, clothing, sick nursing, child care, management? Which of these problems have been well investigated?

6. To what extent have aims, methods, and administrative organization of home economics education taken shape under limitations imposed by conditions of other forms of education? Why do we think of it chiefly as related to ages 14–18 in high schools? As parallel to liberal arts courses? As dependent upon "laboratories"? As yielding almost no forms of coöperation with homes? How can we provide for investigation of problems of specific aim and method on assumption of "optimum" conditions?

7. What is the "case" method of study? Is it practicable to procure, within reasonable limits of precision, type "cases" of home practice, preparation for home practice, needs of preparatory training, present schemes of school preparation, and the like, and tentatively to analyze and evaluate these?

8. What are principles of vocational education in general which are capable of application in homemaking?

9. What is the "home project method" of vocational homemaking?

10. Are the suggestions of Bulletin 28 conclusive?

11. What is the place of household arts in liberal education?

II. What Are Homes?

The "home" is a very much generalized conception. Every person can in a measure appreciate, even visualize, a home or homes. But we still possess no adequate analysis of the essential characteristics and functionings of homes of various kinds. Because of the indeterminateness of prevailing "job analyses" of homemaking and the hardly less vague standards of functioning of the home as a social agency, most current proposals and practices toward education for homemaking exhibit endless evidences of artificiality and impracticability.

1. In the most universal sense, the home is obviously a

place for the rest and recreation of adults. It is manifestly also a workshop for the elaboration of consumable goods — foods, clothing, beds, social intercourse, worship, education. In its profounder aspects it is a means for the nurture of children. These functions are interdependent, interlocked; but, for any given type of home, which are more fundamental, more socially essential, than others? We greatly need concrete analyses of these problems along the lines of the classifications suggested below.

2. It is, indeed, highly desirable that we should have functional analyses of various types of "homes." In the modern world there are many specialized agencies which function, temporarily or permanently, as homes for adults engaged in vocational pursuits — barracks, cantonments, ships, hotels, bachelors' cabins, dormitories, hotels, Pullman cars. There are hivelike homes for children more or less abnormally situated — asylums, boarding-school dormitories, institutional cottages. Homes for monogamous families also exist in several species, from the hotel apartment and housekeeping apartment, the urban "row" or semi-detached house, to the detached urban dwelling, and the farm homestead.

3. If we assume that, sociologically considered, the primary function of the "home" is to contribute to the rearing of children, then the various species of "family" homes should be divided into a number of varieties according to the scope of their work and the means wherewith it is to be done. The following at least are some of the types that require extended analysis (the words "normal number of children" denote expectancy of from four to six children by time mother is at age of forty): (*a*) tenement home, no servant help; normal number of children; annual income less than $800 (1900–1914 prices); (*b*) same, but income $800–$1200; (*c*) same, except apartment with hot water and heat, and income $1200–$2000; (*d*) same, income

$2000–$3000; (*e*) apartment home, one servant, subnormal number of children, income $2500–$4000; (*f*) same, subnormal number of children (one), no servant, income under $1200; (*g*) apartment, subnormal number of children (two), one servant, income $2000–$4000; (*h*) detached urban or suburban house, no servant, normal number of children, income under $1000; (*i*) same, but subnormal number of children, income under $1000; (*j*) same as (*h*), but income $1000–$1500; (*k*) same, income $1500–$2500; (*l*) same, except one servant, and income $2000–$4000; (*m*) detached urban or suburban house, subnormal number of children (one or two), no servant, income $1200–$2000; (*n*) detached house, normal or subnormal number of children, three or more servants, income $7000–$20,000; (*o*) detached farm home, excess number of children, net income (money and kind) under $700, colored; (*p*) same, white; (*q*) same, white, but net income $750–$1100; (*r*) farm home, normal number of children, no servant, net income $800–$1000; (*s*) same, net income, $1000–$1500, irregular help; (*t*) farm home, normal number of children, two or more servants, income $3000–$10,000.

4. It is also desirable that homes should be classified in terms of the ideals or standards toward which they aspire, as well as the conditions they must meet. What are the "standards of living," or perhaps better, the standards of comfort, toward which are striving: (*a*) The American-born manual workingman's family? (*b*) The American-born land-owning general farmer? (*c*) The American-born well-educated professional man or commercial worker? (*d*) The colored tenant farmer in the South? (*e*) The recent Italian immigrant, manual laborer in city? Sociological research is needed to define prevailing types, to evaluate their persistent and their "fluid" ideals.

5. Of the above types, which are "modal" — that is, statistically most numerous — from the standpoint of the

vocational education of prospective homemakers? Which are most prevalent, or expected to be most prevalent, in given communities? Into which types are the girls whose abilities and favoring home circumstances enable them to "go through" high school likely to fit? Into which types are the girls of a manufacturing city, who leave school at 14–16, likely to fit? What are the types likely to be filled by daughters of poor "renting" farmers? Are we to expect the flat or apartment home to replace the detached house in cities? in suburbs? Are home economics teachers expected to prognosticate the future availability of servant help — and for several income classes of homes considered separately? The probable extension of the apartment or flat type of dwelling? The possible evolution of coöperative housekeeping? Development of agencies for the coöperative or delegated care of small children? Future possibilities of "boarding" life in nurture of children? Coöperation of the father, on a short wage-earner's day, in duties of twenty-four-hour day homemaking? Probable future size of family in different social groups?

6. It is suggested that in class work, where not otherwise specified, the term "home" should imply these conditions: detached urban house, no servant, from four to six children, $900–$1500 income standard, American traditions. From this, as a point of departure, variants could be described. In many cities the "cold water" (no heat supplied), "walk-up" three-to-five-room flat for workingmen's families is becoming very common; it means normal number of children at least, no servants, income $700–$1000. Also the separate land-owner's farm home is very prevalent.

III. What Is the Vocation of Homemaker?

Homemaking a Composite Vocation. — It is obvious that the vocation of homemaker is *composite* to an extent char-

acteristic of only a very few other occupations. This remains true, notwithstanding the extent to which certain functions have in America been removed from the homes — such as weaving, teaching, food preservation, gardening, and, now, baking, brewing, and garment-making. *Compositeness* of vocation is ordinarily a sign of primitiveness. When human beings live under primitive, pioneering, or dispersed conditions, there is relatively little subdivision of labor and exchange of commodities. Every primitive hunter, fisherman, tiller of the soil, warrior, teacher, and housewife is in large measure and of necessity a jack-of-all-trades. The home retains this character long after it has largely disappeared in manufacture, transportation, and commerce, because the family is the most universal unit of *consumption* and especially of the productive processes that just precede or are intimately associated with consumption. Sociologically speaking, we can again affirm that *children* are the cause of the present compositeness of the homemaker's activities. If children could be as effectively reared in barracks, hotels, or asylums as adults can live and carry on consuming activities in these elaborate organizations of specialized service, then we should speedily see the end of the highly localized home.

Organization and specialization of service lead to depth of knowledge, refinement of skill, and intricacy of managerial relations. The small "general" farmer, the country storekeeper, the teacher in a small high school, the village mechanic, the country doctor, like the housewife, must always experience the trials of realizing themselves less competent in the special arts, which they must attempt, than the specialists. Utopian suggestions that "homemaking" is (or ought to be regarded as) a "profession" render no service in mitigating the hard reality that for the great majority it must long continue a composite of ill-defined and imperfectly standardized arts.

The first step in the process of defining the vocation of homemaker is that of segregating for detailed consideration some fairly common and constant types of home. The second is to analyze, describe, and, perhaps, *evaluate* the various prevailing forms of skill, knowledge, appreciation, and ideal now found among those of the practitioners of this type of homemaking who would be judged to be slightly above the average by persons possessed of critical and common-sense judgment.

Analysis of Type Homemaking Vocation. — Let us assume as the type to be considered homemakers in detached village or urban houses, no servants, family budget, $1000–$1200 per year, American ancestry, normal number of children (two or three at ages assumed for mothers — 28–34), mothers of elementary school general education, no school education in homemaking. Call this type M. Taking one hundred of these at random, we can for convenience classify twenty as A grade (excellent), thirty as B grade (good), thirty as C grade (fair), and twenty as D grade (poor). For purposes of determining prevailing requirements of the vocation we can confine ourselves to the B grade on the assumption that their standards are those we desire the next generation, on the average, to approximate, but are also *not* the effects of exceptional heredity.

The vocational activities of these B grade homemakers can readily be classified under such major and minor heads as those given in the following table; and a consensus of competent critics could assign to these various groups of activities, for the type of homemaker under consideration, crude measures of their relative importance (weightings) along the lines tentatively suggested by the figures here arbitrarily assigned (it is assumed that total optimum competency would be rated at 10,000 units; and that optimum competency in any one division would be rated as given; and that individual MBx might be rated as shown) :

TABLE I

CLASSIFICATION AND RATING OF ACTIVITIES OF TYPE M HOMEMAKER

Activity Group (Majors)	*Optimum Standards for Type M*	*Rating of Individual MBx*
1. Foods (buying, preparation, serving)	3000	2000
2. Clothing (buying, upkeep, making)	1500	1200
3. Household care and upkeep (beds, cleaning, etc.)	1000	900
4. Laundry	500	400
5. Care of children	3000	1500
Activity Group (Minors)		
6. Accounting	300	10
7. Sick nursing	300	250
8. Housing and furnishing	100	50
9. Adult sociability	150	150
10. Garden and yard	150	100

Detailed Analysis Required. — But it is clear that such an analysis as that given above is too crude and general to serve for practical guidance. For one thing, it makes no distinctions between *skills* and related technical (or artistic and scientific) knowledge. Some homemakers are strong in certain skills acquired purely on the basis of imitation and "trial and success" methods under competent direction; and weak in technical knowledge. Some have excellent technical knowledge but inferior skills. Possibly a third type of power (or appreciation) should also be distinguished, namely, social insight, or, more adequately, physical, social, and cultural insight. It is also probable that distinctions should be made between manipulative and managerial skills.

Furthermore, any adequate analysis must distinguish, weight, and evaluate numerous concrete subdivisions in the above scheme. "Skills" in preparing foods are not general, but often very concrete and specific. Skill in breadmaking may coexist with lack of it in beefsteak broiling.

Competency in making certain articles of clothing may be found together with low ideals of upkeep.

Let it be repeated that the first object of the analysis and evaluation suggested above is to ascertain what powers and capacities are now prevailingly found among homemakers of slightly more than average ability as found in a certain type or class. Such analysis should normally precede attempts to determine what powers and capacities the next generation of homemakers of similar groups should possess as a result of purposive vocational education. In much of current literature on the aims of home economics confusion exists because aspirations are not presented separately from diagnoses of existing conditions; and also because in diagnoses various types and grades of homemakers are jumbled. The problem of vocational education for the girl or woman who in all probability will direct the labor of two or more servants will undoubtedly be found to be different in many essential respects from that of the girl or woman who is almost certainly destined to carry the full load of homemaking by herself. No less important at certain points are distinctions between rural and urban homes, and between homes in apartments and homes in detached or semi-detached houses. Scientific study is certain to reveal other classifications of importance, based, perhaps, upon climati', occupational, and other considerations.

IV. Sociological Scope and Standards of the Homemaking Vocations

1. There are in the United States some 16,000,000 women, chiefly married and widowed, whose principal vocation is homemaking. Of these probably 90 per cent are unable to divide work or responsibility with co-laborers; hence they must carry on all phases of homemaking work by themselves — conspicuously the procuring, preparing, and serving of

food, the making and upkeep of clothing, laundry work, house care, care of children, etc. For women of this class, homemaking, therefore, at least among white people, presents relatively few variable features, as between East and West, North and South. Hence, homemaking is the most numerously followed of all vocations. Next to it, in point of numbers, is "farming." But "farming" includes many very unlike vocations, from cranberry, orange, asparagus, cotton or sheep growing as specialties to dairy, grain, market-garden, or "general" farming.

Domestic service for hire, or favor — specialized and unspecialized — may be classified here as "assistant homemaking."

2. From the standpoint of the sociologist the central fact in homemaking is the rearing of children. The monogamous marriage and the home have evolved side by side, most conspicuously in the north temperate zone, probably in chief measure because of their suitability to the rearing of the children — to the making out of the children the kind of men and women who could best coöperate in producing and sustaining the valuable elements in civilization. All adults must, of course, have places of temporary or permanent abode; but the beginnings of the most realistic home are laid when a man and a woman form a partnership in marriage and soon face their responsibility of rearing through their "prolonged infancy" the children born of the union.

3. Endless conventions, customs, and laws have been evolved to perpetuate and to improve the home as a social institution. Most conspicuous is the division of labor between husband and wife. The prevailing American standard, which expresses in fullest development the standards aspired to in other countries, requires that the husband shall be the "money getter" of the family — that he shall produce the marketable goods (or services) wherewith goods for the home can be purchased. The wife is expected to do

the " elaborative " or preparatory work required in the home to make goods purchased in more or less raw form suitable for immediate consumption. To the mother falls the prolonged and sustaining care of children, especially when small. To the father falls induction of boys, as they mature, into productive service. To the mother falls the vocational " by-education " of the girls.

a. Space need not be taken here to elaborate the biological concomitants of these sex differentiations of work, attitude, and responsibility. Doubtless the respective " natures " of men and women have become somewhat biologically differentiated toward the best rearing, as well as toward the best begetting and bearing of children. On the other hand, many apparently deeply rooted differentiations are founded only in social inheritances of customs, conventions, and other " social " habits and traditions. These last can, obviously, be much more readily changed than the former.

b. A secondary function of the home is to reinforce and develop personality and community of interest in the adult members of the family group. For these it gives a place of rest and some forms of recreation, protection from invasion of weather, and privacy for the social intercourse valuable to the family group.

4. From the sociological standpoint, therefore, the primary standards of good homemaking are to be found, first in the children brought to approvable manhood and womanhood through this agency; and, second, through the enrichment of personality (health, sociability, culture) accomplished for its adult members.

a. It is obvious, of course, that each age brings new conditions to assist or restrict the home in the discharge of its social obligations. Schools take over certain functions; adults resort to clubs for sociability and other recreation; the man's workshop is removed to a distance, so that he

loses contact with adolescent boys; many productive operations that once gave variety to the work of the wife and opportunities to share work with children are being removed from the home.

V. The "Total Problem" of Vocational Education for Homemaking

One great mistake has frequently been made in constructing programs or curricula of vocational education in that teachers and administrators have proceeded to work with existing limitations always in mind from the outset. This procedure is fundamentally unscientific. Programs and curricula should first be worked out on the assumption of *optimum* conditions; then revisions, corrections, reductions, and other accommodations should be made with reference to known and defined limitations or other modifying conditions.

For example: Assume the problem before us is that of providing vocational homemaking education for certain women who are usually factory hands from fifteen years of age to marriage, who commonly marry at from 22 to 25, whose family income from marriage to forty-five will range from $1000 to $1500 (the mother not being a wage-earner), who will rear from four to six children, and who will live in small urban or suburban houses. It is desired that this homemaking education shall function in reasonably immediate competency when first children are born. Let us assume that we are working in a manufacturing city with large numbers of recent immigrants.

We know that the actual situations confronting us are endlessly varied. Some of the girls go to work at fourteen, having finished only the fifth grade; others leave after going halfway through high school. Some at fifteen have been well trained in home craft by their mothers, some possess

little or no skill. Some have been wise "little mothers" and know much about the care of babies, even at twelve years of age; but most of them will have learned nothing of child care by the time their own first baby arrives. Some of them will approach marriage with considerable appreciation of the responsibilities of homemaking, others will rush in heedlessly. If a good day vocational school of homemaking were available, a few of them would stop work and attend it for one or three months in preparation for their new vocation; but most of them would not. If well advertised evening classes in "short units" of homemaking were available, many girls would come for some months, but their interest would center chiefly in making articles of personal wear or adornment, or in cooking dishes suitable for "parties"; but a few would do genuinely productive work in evening classes.

Confronted by this heterogeneous and confused situation, how shall we proceed to devise curricula? Efficient procedure certainly requires that we first determine and document in detail curricula and programs on the assumption of clear-cut and optimum conditions.

1. We can assume as basal these factors: (*a*) All the girls and women we are to deal with are wage-earners from 14–17 to 21–25. (*b*) All will marry, and have families. (*c*) All will be wives of workingmen, having family incomes of $900–$1500. (*d*) It is desirable that all families shall live in accordance with "good" American standards.

2. For the purposes of getting our "total" or "complete" curriculum defined we can assume the existence of these conditions: (*a*) Women engaged to be married and eager to qualify for the vocation of homemaking. (*b*) The prior experience or home training of these women is so slight and ineffective as to be negligible. (*c*) The woman free to give three or six months as may be required to "full time" (eight hours daily) for this vocational education.

(*d*) The woman living with her parents in a small home which can be used in any and all ways as a "productive shop" for educational practice in homemaking. (*e*) The woman living in the midst of neighbors among whom she can find opportunities to care for sick or to assume charge of infants when work of this character becomes essential to her program. (*f*) The school so staffed and equipped as to give all needed individual instruction, supervision of home projects, laboratory work, related reading, etc.

In the light of these conditions we produce curricula, programs, courses, projects, etc., having paid due regard to the various *kinds* of educational products to be produced — skills, applicable knowledge, ideals, managerial abilities, appreciations, etc. Overzealous or "theoretical" teachers might well consider warnings and queries at this point: (*a*) We are not expected to train these young women for a "profession." (*b*) In view of the multiplicity of operations involved in homemaking, we are not expected to train these young women to be as good cooks as hotel chefs, as good nurses as hospital graduates, as good seamstresses as those working for wages, or as good teachers of little children as kindergartners. Overambitious standards or ideals here defeat their own aims. (*c*) What *additions* to their powers and capacities can we expect these people to make during, say, the first five years of married life, as the burdens of homemaking rapidly increase? (*d*) Remember, always, that technical knowledge not built on experience is apt to be a useless possession, whereas skill, even if unaccompanied by technical knowledge, has a large place in the world. The ideal, of course, is skills, manual and managerial, illumined by technical knowledge and social insight.

3. Having made our curricula and programs for the situation described above, we can then proceed to make adaptations and adjustments of them for situations like these:

a. Where young women have had a substantial apprenticeship in their own homes.

b. Where it is not practicable to reach young women, but it is practicable to provide two to six hours weekly of training and instruction in regular public schools during ages 12 to 15 or 16.

c. Where young women are eager for homemaking education, but home facilities for training are unavailable.

d. Where no school facilities are available and teachers must do all work in the homes of the girls.

e. Where women can or will take training only after marriage, but where their own homes can then be extensively used for that purpose.

VI. The "Case Method" of Study

Probably the most profitable methods of approach to the problems here under consideration from the standpoint of the determination of desirable objectives of vocational homemaking education are to be found in the provision of curricula and programs for typical "case" situations, as illustrated below:

CASE A

A woman, 22 years of age, expecting to be married, wishes six months' full-time training in homemaking. She has been an industrial wage-worker for seven years and knows nothing on the "doing" side about homemaking. She cannot cook, set a table, make a bed, or patch a dress. She has had no experience in handling babies, entertaining small children, caring for the sick, buying furniture, or keeping household accounts. As a "boarder" or consumer in her own home she has the usual "appreciations" of good cooking, well-kept rooms, etc.

Assume that at 30 she is to have three children, that she will have a five-room house, in a suburban or village community, and that the family income will be $1200 annually.

Assume that after marriage she will have to rely largely on herself (not having a mother or other elder person living with her), and that she is ambitious to start married life as a good worker in her new vocation as homemaker.

Assume also the availability of sufficient means to give her a good vocational education — a home as a workshop to meet requirements for prepared food, patched clothing, care of babies, on a strictly productive (as opposed to "exercise") basis, as well as books, laboratory facilities, etc.

Problems to be Solved

Problem 1. What should be the specific aims of the six months' vocational education to be provided?

Problem 2. What amounts of available time (assume 150 working days of eight hours each) should be given respectively to:

Majors

a. Foods: selection and purchase, preparation, serving, disposal, re-use, dishwashing, etc.

(*a*) Skills, practical performance.
(*b*) Related technical studies.
(*c*) Related social studies.

b. Clothing: selection, purchase, making, re-making, repairs, upkeep.

(*a*) Skills, practical performance.
(*b*) Related technical studies.
(*c*) Related social studies.

c. Care of house: bed-making, sweeping, keeping articles in order; cleansing furniture, wood, glass, stoves, bathroom fixtures, etc.; making minor repairs to lights, plumbing, locks, etc.

(*a*) Skills, practical performance.
(*b*) Related technical knowledge.
(*c*) Related social knowledge.

d. Laundry, including ironing, etc.

(*a*) Skills, practical performance.
(*b*) Related technical knowledge.
(*c*) Related social knowledge.

e. Children, including sociability and by-education.

(*a*) Skills, practical performance.
(*b*) Related technical knowledge.
(*c*) Related social knowledge.

Minors

f. Household accounting, including especially, planning of expenditures, budget making, use of inventories, segregation of expenditures, investment of savings, etc.[1]

(*a*) Skills, practical performance.
(*b*) Related technical knowledge.
(*c*) Related social knowledge.

g. Housing and furniture: selection, fundamental or long-period readjustments and renovation (not included under "care of house").

(*a*) Skills, practical performance.
(*b*) Related technical knowledge.
(*c*) Related social knowledge.

h. Care of sick.

(*a*) Skills, practical performance.
(*b*) Related technical knowledge.
(*c*) Related social knowledge.

[1] For some types of homes, and perhaps eventually for all, this should be a major.

i. Adult sociability and social culture (excluding sociability with children).

(*a*) Skills, practical performance.
(*b*) Related technical knowledge.
(*c*) Related social knowledge.

j. Yard and garden.

(*a*) Skills, practical performance.
(*b*) Related technical knowledge.
(*c*) Related social knowledge.

Problem 3. What order of presentation of the above subjects should be followed?

Problem 4. In each case what provision should be made for training in practical skills?

Problem 5. How should related technical knowledge be given, and in what relation to practice on productive, useful, skill-forming work?

Problem 6. Should "practical" exercises (non-productive) be accepted in lieu of productive work?

Problem 7. How should related social knowledge be given?

Problem 8. What tests of final competency in each case should be provided?

CASE B

Identical with Case A, except that the total time available for training for vocation is three months, or seventy-five working days, of eight hours each.

CASE C

Identical with Case A, except that women must continue wage-earning, and can give only four (evening) hours weekly for sixty weeks, divided between two years.

CASE D

Identical with Case A, except that women can give only time after she is married and living in her own home. Can then give six afternoon hours in school and twenty-four (or more if necessary) hours to productive work in her own home, weekly, for sixteen weeks. Assume teachers with ample time for visiting and supervision of home work.

CASE E

Farmer's daughter, 22 years old, eighth-grade education. Has always helped in farm home and can perform all ordinary operations with the moderate efficiency produced by home apprenticeship, including care of small children. Has little technical knowledge or social insight relative to the homemaking vocation.

Expects to get married within a year, to have a farm house (northern Mississippi Valley), with cash budget of $600 yearly and income in "kind" (owned house, water, wood, vegetables, fruit, milk) equivalent to $250. Assume three children at age of thirty and only occasional household help.

Assume possibilities of her attending full time for three months a vocational school of homemaking distant 100 miles from her home. Assume this school to possess all reasonable equipment and teaching force required to carry into effect such programs as it might decide to be desirable for students of the class of Case E.

Problem 1. What would such a school establish as its standards of vocational proficiency for such a woman? Classify objectives separately under the categories given for Case A, distinguishing under each between practical skill, related technical knowledge and related social insight.

Problem 2. How will the school test and evaluate the

powers and capacities in homemaking possessed by the woman at entrance? How will it correlate these with the new powers and capacities it will seek to produce?

Problem 3. What will such a school seek to offer as training and instruction under each of the categories given in Case A? Or, what will be its programs of instruction?

Problem 4. What will such a school provide in the way of facilities for practice? In foods? Laundry? Child care? Sick care? Housing?

Problem 5. How will such a school avoid stressing urban conditions? How can it keep solidly in touch with rural conditions?

CASE F

Identical with Case E, except that the woman has gone to high school and normal school and has taught two years, as a consequence of which her skills and technical knowledge of homemaking at the outset are negligible, while her appreciations are normal.

CASE G

Identical with Case E, except that the woman can give three hours daily to the homemaking school, located one hour away, and the remainder to her mother's home, where productive educational work can be done.

VII. Some General Principles

In the framing and passage of the Smith-Hughes Act, granting national aid to certain forms of vocational education, home economics was included at the eleventh hour. A distinguished member of the Federal Board for Vocational Education has publicly asserted that the home economics provision was a "monkey-wrench thrown into otherwise perfectly good machinery." Many teachers of home

economics in elementary and especially in secondary schools who were serenely pursuing the even tenor of their way before the enactment of the Smith-Hughes law now find also that that law is playing the disastrous part of monkey-wrench in their heretofore smooth-running machinery.

What is the vocational education that prepares for homemaking or the work of housewife? Under what conditions is home economics "vocational"? What else can the subject be, if not vocational? These, and many other similar questions are disconcerting, if not haunting, many of our home economics teachers to-day. They are destined to put to the test not a few of current traditions as to aims and methods of education in fields only distantly related to the homemaking vocation. They show the utter inadequacy of some current interpretations of educational values made by men of strong academic prepossessions.

The immediate difficulties confronting home economics teachers arise from a few simple but more or less conflicting conditions: (*a*) Congress enacted the Smith-Hughes law to aid vocational education, and only vocational education. (*b*) The public has all along believed that the home economics courses which had become so generally established in progressive school systems were vocational in intent and results. Hence the public has insisted that schools maintaining these courses should proceed to claim their due share of "Smith-Hughes" money. (*c*) The administering authorities have in some cases denied that home economics courses as ordinarily found are in fact vocational, and have insisted on new and sometimes difficult modifications.

Now, it is well known that many differences of mind in this imperfect world are due to failures to define terms and standards. How far is this the situation here? On the other hand, sore contests always arise when progressive action is being taken, the very nature of which necessitates discarding of familiar habits, and readjustment of stand-

ards. The authorities charged with the enforcement of the law claim that such is often the case here.

The history of the evolution of vocational education shows how present confusion in almost all fields of vocational education arises under both the conditions stated above. A few basic inquiries will make this clear. What does "vocational education" mean? Does it include all those forms of experience, instruction, and training, in school and out of school, which, superadded to the individual's native endowment, finally give him that which we recognize as vocational competency? Then it will be admitted that, in the sense used, every one, substantially, for thousands of years, has received a vocational education — good, bad, or indifferent, complete or incomplete, wasteful or economical, as the case may be. In that sense, then, every housewife and every domestic servant in the United States to-day has received some vocational education, although few have received any part of that education through an agency which could properly be called a school.

We are now on educational bedrock. When and why do we seek to establish schools for vocational education to supplement or replace the other agencies? Only when these other agencies are insufficient to the needs of the time and when a type of school is invented that can give the education. That has been the history of vocational schools of war leadership, medicine, priesthood, pharmacy, navigation, law, civil engineering, stenography, telephone switchboard operating, nursing, and elementary school teaching. It will probably be the history of schools of journalism, acting, indoor salesmanship, waiting on table, poultry farming, house carpentry, school nursing, automobile repair, homemaking, and engine firing. (It can hardly be said that we have vocational schools for this second group of vocations as yet; current attempts are hardly beyond the experimental stage.)

Do vocational schools at first undertake to give *complete*

competency for a given vocation — complete, that is, as reasonably practicable for the age at which graduation is expected? Rarely ever. Sometimes they assume a previous period of apprenticeship — as did earlier schools of law, medicine, engineering, and teaching (under the pupil-teacher system in England). Sometimes they have counted upon what is in effect an apprenticeship subsequent to schooling — as do present-day schools of law, medicine, stenography, and engineering. Sometimes, however, they have paralleled practice and study in order to dispense with *prior* and *subsequent* apprenticeship, as do present-day schools of nursing and elementary school-teaching and as some engineering, trade, and farming schools are endeavoring to do.

It is now good usage to call that kind of vocational education in schools which presupposes previous or concurrent practice of an occupation, *extension teaching;* all that instruction in the art, science, mathematics, and language of a vocation which anticipates or precedes practice of a vocation, *technical instruction;* and all that vocational education which undertakes to teach practical skill and related technical and social knowledge in close correlation as *basic vocational education.* (But technical instruction not directed towards, and usually functioning in, vocational practice cannot properly be called vocational education.)

In discussing *standards* for vocational education let us frankly recognize that many professional schools, notwithstanding the years of history behind them, are far from having yet determined, with any useful degree of precision, either their aims or the validity of their means and methods. Even the best engineering schools are to-day only higher technical schools, although some are now attempting, through summer practice, to give a certain amount of skill and managerial ability. In general, their faculties still satisfy themselves with the easy assumption that practical skill

and managerial powers are things that must be learned in "the school of experience" — with all the wastefulness and maladjustment which that involves. Most varieties of commercial education are still on an essentially technical basis — they do not prepare for a given vocation, but only give the instruction supposed to be useful to one beginning what will be practically an apprenticeship in the practice of the vocation. The one substantial exception is stenography and typewriting — here the candidate is, in the best schools, actually prepared to begin at once the commercial practice of her vocation.

Probably the most disputed question in recent and contemporary movements for the extension of vocational proficiency in various callings has been the value of technical instruction in advance of practice. Long before we had basic vocational schools for such occupations as machine-shop practice, electricity, printing, carpentry, homemaking and farming, our technical high schools had developed courses of technical instruction in, or somewhat *related* to, these callings. But practical men have always been very skeptical of the results of such courses. It is true that these schools can easily be administered so that they will select the most promising candidates for the respective occupations. A little judicious advertising and testing of entrants will accomplish that purpose. Having selected personalities that are certain to attain success in their callings in any event, it is easy and natural, reasoning *post hoc ergo propter hoc,* to attribute the success of these students to the instruction they received in school. During recent years a classic example of this kind has been given very wide publicity. A certain technical high school collected data which showed that boys leaving school at fourteen and commencing work at, say five dollars per week, will have been advanced to the point where at thirty years of age they will be earning, say, fifteen dollars per week; whereas graduates of the technical high

school, possibly starting at the age of eighteen at only five or six dollars per week, will be earning twenty-five to thirty dollars per week at the age of thirty. Now, admitting the facts, they, of course, prove nothing as to the value of technical high school instruction and training. Every observer of schools knows that only very high-grade boys enter technical high schools; that of these only the best survive the first year or two; and that the graduates are a very picked lot, and destined to success in life, schooling or no schooling.

Among all well-informed educators the conclusion is now generally held that for a large majority of callings technical instruction in advance of practical applications — which usually means applications in productive work and under commercial conditions — is almost valueless, and sometimes decidedly harmful. It is obvious that electrical engineering offers a relatively large volume of technical knowledge. A person of exceptional capacity for abstract thinking can spend several years in mastering this knowledge — as organized in mathematics, mechanics, chemistry, engineering theory, etc. Then he can begin practice, and apply his knowledge as he finds occasion. But every man familiar with the conditions of higher education is aware that only from one to three per cent of persons between eighteen and thirty years of age are able to develop the powers required, according to current standards, of electrical engineers.

In pattern-making, on the other hand, skill bulks large and technical knowledge small. The men who ordinarily enter pattern-making are usually strong in " mechanical instincts " and not so strong in those powers of abstract thinking which are exemplified in the study of mathematics. Every educator knows that appeals to common experience will help us here. We should hardly expect a person to profit greatly from several months' instruction in the theory or technique of swimming before he enters the water. The writer once saw an advertisement, " Horseback-riding taught by mail,"

but he retained the hope that the recipient of these lessons had a horse to practice on while learning. In training a man to be a barber or a girl to be a waitress, it is apparent that only a very little advance technical knowledge could be given with profit.

In analyzing scores of occupations from this standpoint, it is apparent that two types of considerations are involved. (*a*) What, in any given vocation, are the relative values of skill and managerial abilities on the one hand, and what we call related technical knowledge, on the other? (*b*) What are the various *learning capacities* of those who are likely to enter such vocation?

VIII. Applications of These General Principles to Homemaking Education

It can be readily understood from the foregoing discussion what have been some of the obstacles encountered in various endeavors to develop vocational homemaking education. In earlier stages, when technical knowledge was imperfectly developed, only the practical arts were taught — cooking, sewing, bedmaking, etc. Often, of course, these subjects, as taught in schools, were very superficial and artificial. Then came the enormous development of technical knowledge, especially in the departments of foods, household accounting and household management. Under the head of "domestic art" similar developments of technical knowledge in departments of clothing, housing, etc., were attempted, but with less success.

A second stage of evolution in homemaking education came when, under the collective name of "home economics," courses based on the productive activities of the home assumed a largely technical character — it must be remembered that *laboratory work, experimentation,* and *practical exercises* are integral parts usually of technical instruction, since, almost never, are they designed to produce basic skills.

Hence the general demand of competent critics to-day that home economics education, seeking to meet requirements of vocational education for homemaking shall: (*a*) provide for the necessary practical experience in productive work required to produce enduring skills, manual and managerial, if it is to be regarded as *basic* vocational education; or else (*b*) connect positively and purposefully with previous practical experience if it is to be regarded as *extension* vocational education.

It is denied that vocational competency in homemaking as that is found now in millions of American homes, and as it is desired on behalf of millions more in the future, can be more than slightly produced by technical instruction alone, even if that include laboratory and amateur productive exercises.

It is recognized that some home economics departments take charge of school lunches. This is good productive practice as far as it goes, even if on excessively large scale for home food preparation, but what schools cover the various fields of foods, clothing, house care, child care, laundry, etc., in this practical way?

IX. The "Project Method" of Teaching Homemaking

1. In the total process of producing homemaking competency to function in adult life, we should recognize several distinct stages or even different areas of possible operation. For example:

a. In girlhood, from six to twelve, it is obviously possible for the mother or for a teacher who can control conditions of time, motive, and familiar implements as can the mother, to train the girl in various specific skills — tea-making, dusting, outing care of infant, darning — and to attach to these and related operations, appropriate technical knowledge, appreciations, aspirations, and ideals.

b. From ten to sixteen, at least during the time of transitions from play motives, interests, and powers to work motives, interests, and powers, it is clearly practicable in the case of a large proportion of girls, to elicit fairly strong interests in *amateur* homemaking — when the *desires* and *motives* are for results functioning as in the adult world of work, but the appreciations and powers are still those of the play stage and spirit, unwilling to tolerate long routines, to search for technical knowledge, to undergo drill or training.

In many cases this would seem to be an appropriate time for rich offering of *household arts* as *general education.* Appreciations, insights, aspirations, even ideals, can easily be formed in relation to novel situations in homemaking, where familiarity with, and enforced drudgery in, domestic operations has not bred the blasé attitude or even contempt. But teachers should be careful not to confuse the results of this general education with those to be derived from effective vocational education.

c. From fifteen to eighteen would seem to be an appropriate time for offerings of *basic* or *extension* vocational homemaking to girls who could see clearly ahead of them wage-earning employment as assistant homemakers, as trained employees in the homes of their mothers or others. For the present, of course, little can be done here because popular valuations of the vocations of "domestic service" are so adverse that self-respecting and ambitious girls seek non-domestic vocations by preference.

d. For young women from eighteen to twenty-five, who expect to become independent homemakers, there exist large opportunities for: (*a*) extension vocational education for those who, like many farmers' daughters, have already had extensive basic experience in a large variety of homemaking operations; and (*b*) basic vocational education for those who, like a large majority of factory and office employees, have had almost negligibly small experience in, or even con-

tact with, domestic operations. Motives may be strongest just before or soon after marriage.

e. Other stages or areas could easily be defined, especially by taking account of different social classes.

2. The "project" is, from many points of view, the best educational device for basic vocational education. It has not yet been tried extensively in homemaking. Its best developments are found in agricultural education. As applied to vocational education, the project is a "job" or unit of productive work, usually of a utilizable or even marketable character, selected and organized as constituting a valuable stage in an educational process.

3. Homemaking projects illustrated:

a. A girl or woman of no previous experience undertakes to make ten shirtwaists of exactly the same pattern and material. From the making of the first she gets a large amount of new experience, accompanied by a certain amount of technical knowledge, appreciation, etc. In making the remainder she increases her skill, organization of effort, etc. Parallel with her work, she can be helped to insight, as to *social, hygienic,* and other general aspects of her work. If, after the making of ten shirtwaists, further increments of permanent skill or of applicable technical knowledge should be small, then the educational value of the project has largely been realized. Further making of shirtwaists would be valuable for production rather than education.

b. An inexperienced girl, directed by a competent teacher, gives three hours daily for a month to providing the breakfasts of a family of six. Linked up with the actual preparation of the food and washing of the dishes, will be such technical matters as planning variations in menus, selecting and buying materials, keeping suitable accounts. Related studies of nutrition, markets, technical processes, etc., can easily be linked up to, and interpreted by, this project by the teacher through lectures, readings, problems, etc.

4. Scores of other suitable projects, large and small, can be devised. Care of the outing hours of an infant for two weeks; care of a bed-chamber for two weeks; performance of family washing for four weeks; washing and dressing of a child or infant for two weeks; baking family bread for a month; canning four dozen jars of plums; preparation of five successive Sunday dinners; keeping the accounts of a family for six months on basis of "slips" supplied by the family; keeping clothing of three children in repair for three months, etc. For service in schools, these projects should be analyzed in detail, reference readings specifically indicated, and related technical and social studies analyzed in detail.

5. Where the previous practical experience of the student justifies the offering of *extension* rather than *basic* vocational courses, there may be less place for projects, and relatively more for topics of study, collection of materials and reports, problems for analysis, laboratory exercises, investigations, etc.

a. For example, a farmer's daughter, age twenty, coming to a short-course, full-time school, who has had much experience with her mother (frequently supplementing her), may be most in need of technical knowledge which she can relate to her already well-assimilated experience. She may most need explanations of the processes she has learned by imitation or rule of thumb methods, including improved processes, accounting, etc.

b. Where home economics is taught as one subject in a curriculum of general education — being paralleled by courses in English, mathematics, physics, etc., it might be possible to give the home economics a vocational flavor by offering it, in the case of pupils of known home opportunities, as *extension* instruction; but the difficulties are great, and the method is seldom used.

c. The "project" is often confused with an "exercise" or even with a "demonstration." For the sake of explicit-

ness it would seem best to confine the term to a unit of work which combines productive and educative possibilities, and possessing possibilities of repeated performance so as to give skills.

6. Problems of Project Method:

a. What should be the "magnitude" of a project? This is partly dependent on the external character of the work, partly on the psychology of learners. Young learners need smaller and shorter time projects than older. Every project should take the learner beyond the play stage of experience into the work stage. Short, fragmentary experiences, even in fields of drudgery, may, by novelty, sustain play interest for a time. For girls, twelve to sixteen, it is surmised that valuable projects should require from ten to fifty hours, no period of application being less than two, and preferably four to six hours. For young women, projects may require twenty to sixty hours, optimum single periods of application (in productive work and related study) being four hours.

b. What should be the "compositeness" or "complexity" of projects? For best learning purposes, probably, a project should center in one natural or normal "strand" or field of activity. Within one day, a housewife dresses children, prepares meals, makes beds, etc. But a learner can probably make best progress by focusing effort on one or two of these series of recurrent jobs, so as to attend to acquisition of skills, interpretations, etc. On the other hand, the related minor jobs normally belonging to a major job should be included in the project. A cooking project not involving related cleaning up; a laundry project not involving subsequent ironing; a breakfast project not involving buying and accounting — these would probably be unwisely broken.

c. How can related technical knowledge and social insight be integrated to the project? Eventually we shall

probably have hundreds of projects given in detail in booklets, with references to related readings, etc. For the present the teacher should seek to build about each project a series of readings, technical and social.

d. Should coöperative projects be provided? Occasionally, but not to an extent which will prevent fullest acquisition of individual powers (of execution) and capacities (for appreciation). Coöperative sociability projects are especially good — giving a reception or entertainment, relieving a poor family. Probably also certain projects necessarily of an "observation and report" character — planning the location of a farmhouse, furnishing a kitchen, etc., could be of a coöperative character.

X. Federal Board's Bulletin No. 28 (1919)

(*Organization and Administration of Home Economics Education*)

This bulletin "may be considered as an official answer to the many inquiries concerning matters of policy in home economics education received by the office of the Federal Board."

In general, the definitions and interpretations found in this bulletin represent the best of available knowledge and practicable expectations in homemaking education. The problems suggested below, dealing mainly with questions of objectives, are expected to arise as further developments take place in this field; but for sake of concrete analysis these problems are here stated as of the present, and with no intention of conveying adverse criticism.

1. It is unfortunate that the law uses the term "home economics" which describes neither a vocation nor the common characteristics of a group of vocations as do the terms "commercial," "professional," etc. The words "home economics" will long continue to connote a group of tech-

nical studies only, in spite of all effort to the contrary. Educators should now make concerted efforts to settle on more serviceable terminologies.

2. Why should it be held that in "separate vocational schools of home economics" which have "but little articulation with the other phases of work of the school system" the courses offered "are usually two years in length, although a few schools offer four-year courses"? Are these arrangements defended? Ought not administrators move steadily toward short, intensive courses, each composed of short units, in vocational homemaking? Will not "long courses" perpetuate the weaknesses of "long-course," overtechnical, insufficiently practical, industrial, agricultural and commercial courses?

3. Is it well to try to force the word "laboratory" to include the meanings given? Etymologically, the word "laboratory" may mean the same as workshop or place of productive work; but historically and practically, in thousands of industrial establishments, colleges, and other centers of research, it now means specially equipped places of experimentation, investigation, testing, and study. It once meant, also, a place of *production* of drugs; but even this meaning is becoming obscured. To try to use the term in a special sense as designating a place for "practice in all the home activities which are taught within the (vocational) school, such as housekeeping, garmentmaking, etc.," is to court endless misunderstandings, misdirected effort and perpetuation of old traditions of technical instruction. A laboratory is *not* a place for the *practice* of a vocation: that is a farm, shop, office, kitchen, home, or school. Let a homemaking school, using "local (or actual) homes" or "school homes" for practice, have one or more small laboratories for testing, experimentation, etc.; but call the practice place a school home or an actual home.

4. Is it wise to provide so extensively for the necessarily

artificial equipment suggested? Homes are found in large numbers within a dozen blocks of almost all except country schools. These are real homes, where real productive work must be done. Judging by experience in other fields of vocational education, artificial equipments of the kind proposed can be used for genuinely laboratory purposes and for demonstration purposes, but never effectively for practice purposes. More readily than in almost any other field it should prove practicable in homemaking to establish coöperative or part-time arrangements. To realize the maximum benefits, these should be on a project basis.

5. "Vocational subjects to be selected (for a course in vocational home economics) should be determined by an analysis of the occupation." This is, of course, indispensable, but it should be noted that, for practical purposes:

a. Such an analysis by *strands* of work or *types* of daily duty is almost valueless unless it also somehow indicate *degrees of proficiency* in each. All homemakers in America now, the very poor no less than the good, can cook, serve, repair clothing, care for children, buy furniture. But we want the next generation to do these things *better.*

b. Because of the few fundamental types of homemaking and the universality of home activities, central authorities (state or, preferably, national) can make these occupational analyses to best advantage. Individual teachers need much help here, especially while standards are so vague. As suggested before, home economics teachers are usually insufficiently equipped with practical knowledge of home productive processes (as carried on in actual homes) as these should be scientifically analyzed, described, and evaluated.

6. "The law provides that schools or classes giving instruction to persons who have not entered upon employment shall require that at least half of the time of such instruction shall be given to practical work on a useful or productive basis." But the Federal Board here holds "practical

work on a useful basis" to mean "instruction in vocational subjects designed as preparation for homemaking." Experience will undoubtedly show that this interpretation is indefensible either as good law or good pedagogy. Practical work on a useful basis is just as capable of recognition and of being provided in homemaking as in gardening, dressmaking, carpentry, elementary school-teaching, and hospital practice.

7. Home projects are recommended. But the rank and file of teachers can make little or no progress in home project work until the leaders shall have worked out guidance materials no less elaborate than are those now found for laboratory practice in technical instruction. Many model projects worked out in utmost detail, and hundreds in outline involving close adjustments to varying conditions, are required as preliminary to any effective utilization of the project method. These should be available in booklet form.

XI. Household Arts as Liberal Education

It is very important that schools of general education, and especially those dealing with girls from 12 to 16 years of age (the period of true amateur spirit of production) should offer courses of household arts, conceived very much as are now home gardening, scouting, and the best manual training, as a means of genuine liberal education. Such courses should preferably be elective, should occupy from two to four hours weekly, and should center in "project" work and general inspirational reading. For a few girls vocational skills and knowledge will doubtless accrue from these courses, as they do for boys in home gardening and shopwork; but unless these are regarded as incidental products the "liberalizing" spirit of the work will be spoiled. Probably appreciations and ideals of ultimate vocational significance will also accrue for many, but these also should nor-

mally be regarded as incidental or secondary accompaniments of effective liberal education suited to these ages. A few general theses are submitted:

1. The fundamental difficulties now encountered in realizing valuable results from home economics instruction by departmental teachers with girls from 12 to 16 years of age are due in large part to confusion of purposes between vocational and liberal. The courses offered constitute minor offerings in schemes of education primarily liberal or general; the specialized teachers have in view ends that are somewhat vaguely vocational, at least so far as technical instruction can serve these ends under the circumstances.

2. The primary purpose of schools for children from twelve to fourteen years of age is the giving of liberal, as distinguished from vocational, education. For pupils who elect to continue their general or liberal education in regular high schools, primary purposes should also be found in liberal education. There is no evidence that a small amount —one tenth to one third—of total time available, given to vocational education, can be made to function as assured vocational competency.

3. Household arts for girls from 12 to 16 years of age (and, if motive can be enlisted, for boys as well) can certainly be made a means of liberal education. To effect this will probably require some important modifications in the means and methods now usually employed.

4. The objectives of liberal education are less easily defined than those of vocational education, the most visible and measurable outcome of which is power of producing in a specified field and for a prolonged period, valuable service or goods, commonly of the kind called "exchangeable," and the exchangeable worth of which is usually for convenience given a money value which readily serves as a measure. "Liberal" education has as its objectives the production of a variety of qualities, many of which may be included under

such terms as appreciations, tastes, sentiments, ideal valuations, ideals, insights, understandings. Liberal education in a given field — language, literature, science, sociability, art, nature, society, religion, government, agriculture, household arts, urban surroundings, etc., etc. — seeks the humanistic ends of deepened and widened social sympathies.

It is very difficult to get teachers to understand the difference between, for example, vocational training and amateur execution, because too few teachers have ever been definitely trained for their vocations, as have been physicians, nurses, locomotive engineers, dentists, military officers, and architects. College professors, superintendents, principals of schools, high school teachers, and home economics teachers are rarely, if ever, trained to a determinate work of *teaching*. They have received much instruction, of course, which, more or less vaguely, has been assumed to be necessary to their success as teachers or executives. But for the rest they have " picked up " their vocations in a naïve, primitive, and more or less " hit or miss " fashion. Hence, educators find it exceptionally difficult to form distinct ideas of what is meant by specified specialized vocational training.

5. What will be some of the means and methods of " liberal " household arts education?

a. It must not be obligatory. The girl must be attracted to it, not driven to it.

b. It must, to the maximum extent practicable, use the girl's own home, yard, bedroom, mother, father, brothers and sisters, pets, dress, health, and aspirations as means of objective interpretation, but always only in the friendliest coöperative spirit. Nothing forced or inquisitorial will do here. To a large extent, teaching must be impersonal, reference always being made to " third parties."

c. Much reliance must be placed on stimulating reading. We have hardly begun yet to produce readings idealizing and interpreting the home, as the army, scouting and busi-

ness enterprise have been idealized for boys. Results of individual reading must, of course, be socialized by conference, discussion, reports, etc.

d. The demonstration of standards by "model apartment," house, room, article of furniture, curtain, bed, set table, dress, home apparatus, should play a part as objectifying means, but due allowances should be made for the "soullessness" of these when they are not in practical operation or use.

e. Demonstrations of process — cooking, clothes-making, bedmaking, washing of baby, gardening — give vitality and concrete interpretation of standards. The apperceiving powers of girls are obviously great here toward the formation of tastes and standards.

f. Projects are especially valuable as educational means, and naturally the majority will be "home projects" — that is, the inspiration and direction will come from the school, but the time, place, and, largely, the means of execution will be provided by the home. The range of projects offered by the school should be as extensive as practicable so as to give utmost latitude for choice by learners. Projects for purposes of liberal education should possess elements of novelty, appeal to creative powers, and should enlist all that can best be summarized as "amateur powers."

6. What would be some of the specific objectives of household arts organized as a means of liberal education for girls from 12 to 16 years of age?

a. To help the girl to see her own home in its most ideal light. All over southern France, we read, the war-dislocated women will take even one room, a bed, a trunk, and a little stove and will make a nest, a home, a haven, a foyer, for frightened, tired, and sleepy children, a place to which the lonesome hard-driven man comes back as to the center of existence for rest, the supreme recreative activities, and social uplift. Only the woman, rich in homemaking in-

stincts, customs, and, perhaps, training, can make the real home. Can we not, by readings, pictures, discussions, model apartments or houses, help to see the home as the little central power plant or cell whence radiates much of the social energy that makes the world go well?

b. To help the girl appreciate the facts and problems of the financial upkeep of the home through labor given outside.

c. To appreciate the fact that labor, devotion, and management, wisely given in the home, are in the highest degree productive, even though not appearing in the United States Census as "gainful occupations."

7. The spirit of the school of liberal education is largely that of high-grade play; the spirit of the vocational school must be that of serious work. Only one worker in ten thousand can afford to pick daisies as he travels the roads of work. The spirit of liberal education is that of the traveler for recreation and enlightenment; the spirit of the vocational school is that of the man who has business at a given destination, which destination he must reach at the earliest possible moment. The spirit of the school of liberal education is diffusive, catholic, rich in varied human contacts; the spirit of the vocational school is one of concentration of effort, singleness of purpose, and contacts limited to those essential in the economic process, moving directly toward fulfillment. "Work while you work," is the motto of the vocational school; "play while you play," of the liberal school.

For interpretations as to what is meant by "liberalizing" education, we must go to such fields as literature, music, history, geography, plastic art, travel, the moving pictures, current reading, and gardening.

CHAPTER IX

PROFESSIONAL EDUCATION

It is not the purpose of this book to analyze the numerous problems of vocational education which are peculiar to that group of callings which we designate "the professions." It is well known that in very large measure these problems vary greatly with each profession. The history of legal education presents almost no points of similarity to that of engineering education; and both differ greatly from theological, nursing, and military education respectively.

But there are a number of current problems of professional education which are almost identical with those found in other vocational fields. Analysis of these may assist in the determination of general principles. In almost all the professions there are found tendencies towards specialization. Wherever, in professional education, schools have been substituted for apprenticeship, strong demands are felt for more effective training as against instruction.

Specialization of Professional Education. — In every profession conflicting ideals and practices exist as regards specialization of practice. These conflicts disturb in a measure current plans for better professional education.

It is uncertain as to how far in the near future further specialization may be expected. These are some suggestive phases of the general problem involved:

1. Teaching as a professional field is undoubtedly in process of extensive specialization. For many years, college teachers have specialized along the lines of their subject-matter. All secondary education has likewise developed

departmental teaching with the result that men and women preparing for this work find themselves more and more obliged to become specialists. It is sometimes held as advantageous by employing authorities in large schools if these secondary school specialists shall have given service in either an elementary school or very small high school where specialization is impossible, but to impose such previous experience as a requirement is now held as impracticable, and unfair to the lower schools. When, therefore, we speak to-day of the "teaching profession" we are in reality including thereunder a very wide range of specialists such as: kindergartners; primary school teachers; elementary school teachers; departmental teachers of drawing, music, physical training, French, German, English, history, art, mathematics; and also a large number of vocational school specialists such as teachers of stenography, machine shop practice, plumbing, technical mathematics, etc.

2. In medicine there has been for many years a tendency for the more capable men seeking the most remunerative work to become specialists, not uncommonly after a period devoted to general practice. Hence the public recognizes the existence of specialists on: eye, ear, nose, and throat; gynecological practice; diseases of children; pulmonary complaints, etc.; and also not only surgery as a division by itself, but in addition specialties in operative surgery. Furthermore, in large cities, one detects a distinct tendency towards more extensive specialization still, such as specialists in diagnosis, in after-care, etc.

The oculist and the dentist may be the forerunners of an army of specialists who will, from the start, devote themselves to their limited field of work only. Optometry, now legalized in a number of states, may be an early example.

The field of medicine, on its diagnostic, curative, and preventive sides, is becoming so large that still further specialization may be expected. Public health service, medical

inspection in schools, surgical and medical work in armies, hospital practice, etc., all involve material differentiations among workers in medicine.

At the present time, except as regards dentists and oculists, it may be said broadly that professional theory favors the maintenance of organization of medical teaching and training on the basis of broad preparation at the outset, followed, after a period of general practice, by specialization. This was formerly the prevailing attitude also as regards the training of teachers and engineers.

How far such an ideal can be maintained on an economical basis is doubtful. The analogies of almost all other fields of human occupation strongly suggest that specialization at the outset is more or less inevitable in medicine as it has proven in other fields; but that such specialization must be so organized as to give adequate knowledge of related subjects goes without question. It is quite possible that the growth of dentistry as a separate profession suggests what may ultimately appear in many departments of medical practice, namely that from the very outset, carefully selected persons will be trained for the exercise of specialties. This may necessitate also the development of specialties in general diagnosis, followed by diagnosis as a highly expert function for the few rare leaders, as suggested by the experiences reported from Rochester, Minn. Unless the practice of medicine comes to be a public function supported largely at public expense, it seems impossible that the prolonged preparation now required by the more advanced institutions can be met on the part of those who must ultimately carry on medical practice among the poor, or in rural areas.

3. In the practice of law, as in the practice of medicine, there is an obvious tendency towards specialization, but only after a broad basis of general training and an expected period of more or less general practice. In large offices

beginners not infrequently specialize from the outset. But few, if any, proposals seem yet to have been made that specialization in preparation for, and practice of, the law should be provided from the outset. But persons desirous of finding "shortcuts" to law practice or of using admission to practice as a convenient stepping stone to political office are still able to find accommodating "short course" and evening schools of law which are practically indifferent either to admission or training standards.

4. Military leadership is at the present time broadly differentiating the two fields of army and naval leadership, the courses of preparation for each field being quite unlike each other. Within each field, however, there seems to be comparatively little effort as yet towards specialization, but the development of special branches of army service such as aeronautics, communication, supplies, submarines, etc., will probably entail much specialization in preparation if military leaders have again to be trained on an extensive scale.

5. The engineering professions are undoubtedly in process of very extensive differentiation, — a process which has been recognized only in part by the institutions giving training. Heretofore, engineering colleges have probably exaggerated the importance of fundamental training in mathematics, applied science, and drawing, and have underestimated the importance of practical participation in active work. Graduates of best-supported technical schools now, in large measure, promptly specialize on leaving their institutions in such various lines as electrical engineering, naval architecture, assaying, mining engineering, mechanical engineering, railway engineering, civil engineering, sanitary engineering, etc., and there seem to be good reasons to believe that further differentiations may be expected within the next few years.

Here again are problems like those arising in the case of medicine. However desirable may appear a prolonged

course of preparation for the engineering callings, and however much such prolongation of training may be urged by those educators who are apt to base their conclusions upon a few striking cases of advancement to leadership and in research, nevertheless the desirable optimums of efficiency and economy in preparation for the various fields of engineering service are yet to be discovered. Very probably there will be the development of programs for the training of a wide range of specialists who will prepare for their work in shorter time and who can render their service at relatively small cost to the community.

6. The theological callings exhibit as yet comparatively little tendency towards specialization, except, possibly, as regards missionary service.

7. Nursing in recent years has become substantially a woman's calling, but because of the peculiar survivals of apprenticeship in methods of training for it, such training has become almost exclusively standardized in the hospitals. The result is that the so-called trained nurse represents an investment in training and preparation and natural character, which puts such service beyond the reach of any but prosperous individuals and public institutions. An inferior form of home or sick nurse is now available under some conditions but it is not apparent that the training for her work has been standardized as yet.

Various forms of public service are now creating large demands for occupations analogous to those of the nurse. Medical inspection in schools, public health service in cities, welfare service in industrial establishments, to say nothing of the demands imposed by war, are requiring specialized forms of the nursing service for which adequate specialized training has not yet been provided. We are here undoubtedly in the presence of necessity for specialization against which naturally the traditions of hospital methods of training nurses will long be opposed.

8. Other professions. There are in process of development a large variety of other callings which gradually approximate the character of professions. Among these are journalism, agricultural leadership, business administration, accountancy, applied science specialties and "efficiency service." The extent to which these will be specialized when fully developed is not now apparent, but every tendency is in that direction.[1]

Pedagogy of Professional Education. — No adequate attention has yet been given to what might be called the pedagogy of training for a profession. Professional schools, as noted elsewhere, were in the main originally simply finishing schools for persons who had completed an apprenticeship in the elementary practice of the calling itself. Later, as apprenticeship became obsolescent in such fields as engineering, medicine, law, and military leadership, the professional school undertook complete responsibility for the training of the inexperienced novice, but only very reluctantly did the earlier schools develop means beyond textbook stage of such preparation. Gradually, however, laboratories have been introduced to supplement lectures and textbook study. Only very recently in medicine and engineering has actual practice been provided through summer

[1] The following are some of the "specialized professions" culled from the index of occupations prepared by the Committee on Personnel of the U. S. Army (1918):

Aeronautical engineer; analyst, food; architect — engineer, landscape, naval, ship and all craft, supervising; automobile engineer; bacteriologist — food, general, water and ice; cartographer; chemical engineer; chemist — acid and dyes, analytical, cement, explosives, fireworks, poisonous gases, soaps; civil engineering — bridge, buildings, concrete, highways or streets, hydraulics, hydro electric power plant, irrigation, railroad, structural steel, water supply and drainage; dentist; draftsman; electrical engineer; electrotherapeutist; epidemiologist; forester; heating and ventilating engineer; hydrotherapeutist; mathematician expert — calculus, computer, general, trigonometry; mechanical engineer; meteorologist; mining engineer; neurologist; nurse; optician; osteopath; pharmacist; physician; physicist; psychologist; sanitary engineer; scientific observer; sewage disposal expert; surgeon; surveyor; topographer; veterinarian.

vacation work and otherwise to supplement technical studies. Nursing is the one profession which has persistently based its preparation upon the older methods of apprenticeship. Under former methods of law instruction the moot or "mock" court was the only semblance of practice possible to the student. In many essential respects, probably, the modern case system of legal instruction (which came as a distinct revolution) supplies at least some of the conditions of practice. Current proposals for the extension of part-time education in professional preparation for engineering and teaching reflect a widespread conviction that much more practical participation must be provided in the professional education of the future. It is not improbable that in engineering, medicine, teaching, and military leadership, the largest and most promising developments of the immediate future lie in the direction of the development of part-time systems of preparation.

It has been suggested at a number of points above that quite probably preparation for the exercise of a specialty in a profession will constitute a new order in professional training and practice in the not distant future. There is involved here a conception, still somewhat obscure, of the differentiation between two aspects of professional training, namely, one in which definite executive ability is made the primary purpose, while the other has as its chief end general "appreciation." It is sometimes vaguely said, for example, that the dentist should be a physician also. Economically, of course, it is wholly impracticable to train any one person as a physician and add thereto necessary dental training and have, as a result, a professional man who can give service at a reasonable rate to the public.

But a better knowledge of the essential aims and methods of professional education than we now possess will probably make clear to us the fact that the complete training of the dentist, while necessarily involving a large amount of

very definite instruction and training in those fields in which he is expected to exhibit proficiency as an adviser and workman, will also involve a somewhat less definite and much more general study of a wide range of topics connected with the general maintenance of health. For example, it is not expected at all that the dentist shall be competent to advise patients as regards orthopedic or ocular difficulties. Nevertheless, some appreciation of the relation of such difficulties to the general health of the body might be advisable for the dentist and would enable him, at least in some cases, to direct his patient to diagnosticians and practitioners who could give him the specialist assistance which he needs.

Similar considerations apply in the case of engineering. Quite possibly, the future will see the development of many special types of workers in the engineering fields. Primary objectives, both in the training and in the practice of such specialties, would be the competent execution of the tasks commonly falling to their lot. The instruction and training necessary for these purposes can well be supplemented by a wide range of more appreciative learning as to the problems of engineers in general.

Another illustration may be drawn from the field of nursing. The functions of the typical school nurse are now being defined with some clearness. Quite obviously a prolonged course of hospital training is not at all essential to the making of a competent school nurse. The school nurse will not be practitioner or diagnostician in any extended meaning of those terms. It will be valuable for the school nurse, doubtless, to have had at least a few months in hospital work, just as it would be of great value that she should have had at least a few months in courses designed for the training of teachers. Nevertheless, the primary efforts of the school nurse in preparation must be directed towards developing definite competency for the meeting and solution of those problems which the school nurse is likely to encoun-

ter. This involves an almost entirely new field of professional training.

The Professional Training of Teachers. — In America specific vocational schools now exist for the *training* of kindergarten and elementary school teachers. But only in rare instances yet do we find schools wherein secondary school teachers are *trained.* Secondary school teachers acquire such practical proficiency as they possess in the school of experience, often, if not usually, to the heavy loss of the pupils upon whom they must practice their untried hands. Since our normal schools are, as yet, far too few to supply enough teachers for the elementary schools (the vast majority being women, whose teaching careers last only during three to six pre-marriage years) a large proportion of untrained novices in elementary education also must acquire such competency as they are ever to possess in the "school of experience."

But vocational schools for teachers will yet be developed on a large scale — that is inevitable in our social economy. How far may we expect the general principles of vocational education to be easily accepted by such schools? This question is peculiarly important in the case of teachers for vocational schools as shown in another chapter.

Our theories of vocational training in normal schools are very incomplete and conflicting in spite of three quarters of a century of experience in their evolution. Recent studies have shown the extensive variations existing, even within a single state, as regards relations of practice to technical instruction. In the typical normal school, programs of general and of vocational education are almost hopelessly blended. Lack of clearness as to professional objectives permits many normal schools to devote substantial proportions of their energies to the pursuit of such mystical ends as the making of "personality," general adaptability, culture, common sense, and other qualities, in the endeavor to realize which there is much confusion of means and ends.

In the growth of practice teaching in all schools we find ineffective definition of vocational objectives in the training of teachers. Originally, such schools were employed largely as places of observation. It was customary at first to speak of the school attached to the normal school variously as " model school," " school of observation," " experimental school," " school of practice." Only slowly have the various possible functions of the practice school for elementary teachers been given definition; and in most cases they yet fall far short of meeting the requirements of sound vocational education.

Practice teaching is still provided for only at the end of a considerable period of general or technical study, instead of at the outset where it would constitute a concrete basis for technical study later.

Again, only in a few normal schools of the country is provision made for taking the initial stages of practice teaching on a simple basis for beginners with small classes of five or six pupils. In many cases, novices are still placed in large schools for comparatively short periods which afford little or no opportunity for managerial skill and in which the complications of management seriously confine them. The better ones, naturally, acquire a reasonable degree of competency, but probably, for the average teacher, present methods of practice teaching are very imperfect.

CHAPTER X

THE ADMINISTRATION OF VOCATIONAL EDUCATION

Because the movement for vocational education is essentially contemporary and because there exist few precedents to guide organization and administration, the number of unsettled problems in this field is exceptionally large. For ascertained types of vocational education, what are the most effective areas of administration and what the best places of location? What are the best sources of support and control? How shall surveys be provided, what are the types of schools to be provided, and what the age groups to be served? How can coöperation with labor unions be assured, what shall be done with "product" arising from the work of the school, can "coöperative education" be made effective, and what can be done with "preapprenticeship" and continuation school education, and can vocational education be compulsory? What is to be the relation of the junior high school to vocational education? These are but a few of the administrative problems which will require extended study on the part of educators and influential laymen in the near future. Only very summary analysis is possible at this point.

I

School Areas. — The conditions which determine the area suitable for the administration of a specified type of vocational school include the following: (*a*) The probable minimum area from within which a number of pupils sufficient for economical administration can regularly be assembled who

desire the form of vocational education under consideration, and who will probably follow that vocation; (*b*) the inclusion of sufficient facilities for practice work on a productive basis, preferably in "going" commercial concerns; (*c*) the development of an area of taxation designed properly to distribute the cost of maintaining such schools. For many types of professional schools, the state as a whole will doubtless continue to be the administrative area as is now the case where state universities include engineering, medical, law, and agricultural colleges, and where the state as a whole maintains one or several state normal schools. Even where the size of the state makes it expedient to have a particular type of vocational school located in more than one place (as, for example, state normal schools) experience seems to indicate the desirability of employing the state as the unit of administration instead of dividing it into districts. The results of using the state alone as the unit of administration are advantageous in equalizing the distribution of the burdens of support and of the offerings made to students.

It seems very probable that in the smaller or more sparsely settled states many types of specialized trade schools will have to be located at centers of population, and that the state area as a whole will have to be utilized as a basis for the support and administration of these schools. For a time, doubtless, the practice at present prevailing will be followed. The city as an administrative unit organizes and conducts the vocational school. Non-taxed areas (non-taxed for this purpose) send their pupils in and pay tuition; and the state reimburses the tuition — paying for part of its outlay on somewhat the same basis as it reimburses or aids the community maintaining the school. But this is hardly a satisfactory basis for permanent adoption. It resembles the situation prevailing in high school education before high schools were made generally free and generally accessible

to all young people of the state. Eventually, each type of vocational education must be made generally accessible without cost to suitably qualified persons wherever resident within the state; and the property (or other taxed valuables) of the state as a whole must bear the burden of supporting this education as a needed public enterprise.

Where, however, certain types of industry concentrate in particular regions, it may prove advisable to constitute these regions administrative areas for the specific forms of vocational education designed to prepare for them. This would be done on three assumptions: (*a*) that most, if not all, of the learners of the vocations involved would come from within the area in question; (*b*) that only within that area would strong interest exist in the maintenance and direction of these types of education; and (*c*) that the taxable valuations properly to be drawn upon for local contributions (not state or federal contributions) to this type of education owed their origins largely to these localized industries.

The optimum size of a given type of vocational school will have much to do with determining the area most suitable for administration. There are good reasons for believing that special types of farming as well as homemaking may be very well taught (at least to the extent of intensive, 2400 hour per year courses, of one or two years in farming, and of six months to one year in homemaking) on the basis of one teacher to a group of fifteen pupils, dividing his or her time between instruction (which will be largely individual) and supervision of home projects (which will be wholly individual). Under these conditions it is possible that, in a thickly settled farming area, in which many of the boys and girls will desire suitable vocational school training (basic rather than extension) in farming and homemaking respectively, the administrative area for the school could coincide with that for the general high school.

In the case of schools for the building trades, for railroad

operation, for salesmanship and various other commercial callings, including specialties such as traction engine operation, automobile repair, tailoring, barbering, the callings of hotel cook and waitress and the like, the probable necessity of locating them in populous and generally accessible centers will tend at first to make these centers also the administrative units. If such tendencies prevail we may expect an increase in state control, following state supervision.

The location of a given vocational school within the area adapted to it will depend, probably, in most cases, first of all on the opportunities existing for coöperative participation in part-time work under commercial conditions; and, second, on conditions of accessibility.

The typical medical college is now located in a city where abundant facilities for clinical practice are found. Schools of stenography and typewriting are found most largely developed in commercial centers. Schools for nurses are naturally established in hospitals, preferably those centrally located. Schools of navigation are usually located on boats and in harbors.

In such occupational fields as printing, engraving, accountancy, acting, sign painting, clothing manufacture, dentistry, pharmacy, optometry, and the like, it is highly probable that the state as a whole will, in many cases, serve as the most convenient administrative area, and that schools will be located in the one or more largest cities where facilities and opportunities for productive work tend to gather.

It is clear that in the case of many types of vocational schools it will be impossible so to locate them that pupils, especially those residing in village and rural areas, can live at home while attending. Once this necessity is accepted in the case of particular types, the obviously economical procedure will be to locate the school where coöperating practice facilities are most satisfactory. Without doubt the

cost to the student of traveling to and from the school will eventually be met from public funds because of the sound social policy involved. It might also be well within the limits of sound public policy to provide from public funds for the student's cost of maintenance while away from home. Whether such a policy will receive early approval will depend much upon the after consequences of the war, and the extent to which, on the one hand, vocational schools prove themselves really effective, and on the other, the willingness of the public to extend its investments in vocational education. But if, as is suggested elsewhere, the learner in the basic vocational school receives in wages the equivalent of his net productive work, his living expenses away from home could be in part met without expense to his family or to the state.

Some special cases involving location of schools will arise. It is believed by some that the establishment of schools of farming for city boys would be profitable to a limited extent. Were this done, of course, the practice fields and facilities for projects with live stock would require to be provided differently from those for farmers' sons. Probably the most effective procedure, in case it is found that city boys in substantial numbers can be turned towards farming (which is far from having been demonstrated), would be for the school to rent suitable land in one or more tracts, undertake the necessary capital outlay and then sublet to pupils for independent, commercial projects as in the case of the home projects. Here again it is not certain that facilities can be so provided that pupils can reside at home. Where large cities are served, suitable land may be found only at such distance as to preclude daily commuting.

Again, in cities, some women will be found, who after several years of wage-earning in non-domestic occupations, will desire to take courses in homemaking, while still living in rented rooms or boarding houses. The provision of suit-

able practice facilities for these will doubtless entail their taking employment as house servants, with stipulations that their time shall be sufficiently free to permit of receiving the necessary instruction while carrying on productive project work in the homes of their employers.

II

Support. — It seems now probable that the support of public vocational education will generally be divided among at least three agencies — the local community, the state, and the nation. Several principles underlie and justify this method: (*a*) The cost of vocational education is heavy. (*b*) Communities vary greatly in their respective abilities to meet this cost. (*c*) The benefits of vocational education (in the shape of additions made to public wealth by well-trained workers) tend to diffuse themselves over the entire country; hence as far as practicable the burden of supporting these schools should be distributed to an extent consistent with effective maintenance of popular interest, and feeling of local responsibility. (*d*) The division of the controls of initial direction and final approval, between local and central agencies which follows naturally on division of sources of support, probably gives the most effective administration possible to a democracy. Local agencies are apt to be concerned with the immediately practical, central agencies with the scientifically efficient. Local communities can rarely afford to employ men gifted in leadership; central agencies can frequently do so, because of the wider areas served. Local agencies are close to popular demand; central agencies to scientific standards. Frequently the local agency can best make initial proposals, while the central agency renders its best service in amending, standardizing, and approving local proposals. By the development of definite differentiations of function between local and cen-

tral — community and state, state and federal union — agencies, so that no twilight zones shall exist permitting divided responsibility or evasion of responsibility, it should prove increasingly possible to realize the maximum of efficiency compatible with final democratic control.

Private Support of school vocational education (on a commercial as against a philanthropic basis) has long prevailed on a limited scale. The by-education of apprenticeship and other forms of participation may be assumed to have always rested fundamentally on a commercial basis, — the master took and taught his apprentice primarily because it paid him to do so. Guilds of masters or journeymen occasionally collectively bore the expense of some special schooling of apprentices. The continuation schools of Germany and a variety of forms of older extension school education owed their inception largely to these collective efforts. Guilds have also maintained scholarships and even schools for full-time day education, some of which survive in England to-day.

As noted elsewhere, many professional schools, a very few trade schools, and a number of technical-industrial schools have been self-supporting, but as a rule these have required the aid of endowments to supplement the fees paid by students.

American corporations have at various times and especially in recent years undertaken to maintain schools for the instruction and training of selected classes of young workers. The latest of these attempts are the "vestibule" and "upgrading" schools established in munitions and other plants which were under great pressure to produce war supplies for the war while being deprived by the U. S. Employment Service of freedom to hire employees from rival firms or localities. A unique type of private effort is found in the plan of leading organizations of American printers (employers and employees) to undertake collective action in

the training of certain classes of skilled workers as specialists for their industries.

In spite of the variety and commendable character of these attempts, few careful students, it is believed, have any serious expectations that *private* effort can, under American conditions at least, prove at all adequate to the support of the vocational education needed in this country in the future. Some of the reasons for this position do not yet seem, however, to be popularly understood. The contention, often expressed by individualists in spiteful tones, to "let employers train their own workers" is not infrequently heard also from educators of prominence. School authorities, voicing demands for economy in public expenditures, often take the stand that the cost of directly specialized trade or other vocational training is not a legitimate charge upon public funds. Obviously there still exists much confusion in the public mind, some of which should be cleared up by consideration of the sociological problems involved.

Where the employers of certain forms of service are very much scattered and not well organized for coöperative utilization of service, it is clearly futile to expect them to train new workers to replace the old. We are all employers of physicians and lawyers, but we do not coöperate to this end. Hence we make no direct attempts to give these employees of ours vocational education. They get that by private effort, or as result of endowment, or through the state, and then sell their services to us individually.

But where employers *do* coöperate, as in church organizations, their organizations at some point take charge of vocational education, either privately or through municipality or state, often aided by endowments. Thus we get agencies for the vocational education of priests, teachers, and military leaders.

Where employers have formed a corporate organization — as in a stock company — on a large scale and with re-

sources sufficient to enable them to plan their work far ahead, there would be no more inherent reason for their refusing to train their own workers than to provide in advance of need for their own buildings and machinery, were it not for the crucial fact that *ownership of laborers* cannot be secured, hence no individual employer could be given any guarantee that he could reap what he had sown in the way of investing in the vocational education of those who are to be the workers of the years to come. When persons who are controlled by, rather than in control of, vague generalizations say "let industry train its own workers," they probably picture all of the employers in a given field of production acting openly and deliberately in concert — a condition, of course, which both public opinion and legislation have striven strenuously to prevent, and which, except in rare situations, the very fundamental natural laws of economic production effectually prevent. Usually a builder is not in competition with a printer or cloth manufacturer; but normally one builder is in sharpest competition with other builders, both for opportunities to sell service and also to buy subsidiary service. If one builder were to make any investment in the training of prospective workers, he knows that he would probably promptly lose them to his rivals. (It can safely be assumed that apprenticeship, to the extent which it is found in the building, manufacturing, mining, or transportation industries, does not now *cost* the individual employer anything.)

Where conditions give to one employer a substantial monopoly of opportunities he naturally begins to invest in systematic vocational education. The most noteworthy example of this at present is found in municipal telephone service, especially where the employment of girl workers is involved. These, living mostly at home, are not "mobile" workers, as between different cities. Within a given city homemaking is the only extensive "competitive" occupa-

tion, but this usually comes only after sufficient years of service have been rendered to repay outlay on training.

Large corporations — telegraph companies, railway corporations, department stores, manufacturers protected in a measure by patents — often undertake to give a moderate amount of vocational education to their actual or potential employees; but everywhere these attempts seem to find premature limits in conditions growing out of the mobility of labor and the rivalry of competing concerns.

In a broader sense, of course, every employing agency is giving vocational by-education through supervision. But this is not intended to entail any cost in advance of the worker's production. The wage rate for beginners takes care of that.

The following are submitted as representing sound principles in regard to vocational education under private auspices:

1. Vocational by-education through employment or productive work can be successful from the standpoint of the employer only when the product of the learner is sufficient to provide for the usual charges against production — wages, overhead expense, interest, and profits.

2. Vocational by-education is usually not economical or effective from the standpoint of the employee.

3. Where producers or consumers have such corporate organization that they can be assured of the services of those in whose direct vocational education they make a substantial investment, it becomes a natural course for them to develop facilities for such training. But society is endangered by the monopolistic character of such organizations, especially those devoted to production; and eventually its control and attendant guarantees of normal returns of all natural monopolies create conditions under which the cost of vocational education is practically guaranteed by the state — as it was also in the case of vocational schools established by the war industries.

4. It is futile to expect sharply competing corporations to unite effectively in providing vocational training for workers. Whether employers' and employees' organizations can in the future so unite without detriment to public interest is not yet apparent.

5. In no event can we expect private support of vocational education to develop adequately to meet the needs of more than a negligible fraction of the two to three millions of young people who must annually find their way into productive occupations in America.

Public Support. — Within the last dozen years nearly every state in the union has, by its legislation, committed itself to the public support of one or more forms of vocational education. For nearly half a century, indeed, many of them had through permissive legislation legalized expenditures of public funds for commercial education and also for manual training, household arts and agricultural courses; and while this had probably not been done in the conviction that the work offered would function in specific and immediate vocational competency, nevertheless there was involved acceptance of the idea that the courses thus encouraged would ultimately prove more valuable for vocational than for any other reasons. In the debates and discussions on this subject during the twenty years from 1890 to 1910 the thesis was often strongly supported "that trade workers and factory operatives should not be trained at public expense." Equally it was held inexpedient that the schools should train people to be "cooks" or "farmers." But approval of public support for these forms of so-called vocational education that would teach the "principles," or the "underlying science and art" of vocations gained steadily notwithstanding the illusory character of objectives often vaguely held.

When, therefore, the conviction gained currency between 1906 and 1915 that much of the work of technical high

schools, manual training, agricultural, and household arts courses, then being developed, would not meet public expectations for vocational education, the soil had been prepared for more positive and practical proposals. It was now a matter of only moderate difficulty, once leading educators and legislators were given accurate information as to purposes contemplated, to have enacted legislation providing for state and even national support, for industrial, agricultural and homemaking education. The legislation enacted during this period in Massachusetts, Connecticut, New Jersey, New York, Wisconsin, and other states as well as the "Smith-Hughes Act" passed by Congress clearly indicates the serious intentions of legislators that the education thus provided for should be genuinely vocational and should be freely, if not generously, supported at public expense.

The problems involved in the public support of vocational education were thoroughly discussed during this period; and agreement has finally become so general on the principles involved, that only a summary is needed here.

Principles of Public Support. — 1. It is now agreed that, from the standpoint of sound public policy the state is at least no less obligated to support needed vocational education than it is to support secondary or collegiate general education. Society at large, and not the individual educated, is the chief beneficiary. Furthermore, if by making such education free of tuition charges many more persons and among these many of the most promising persons can be induced to take it, then is the state no less justified in assuming the entire burden of this education than it is in fully supporting secondary general education.

2. The desirable limits to public support of vocational education can only be determined by analysis of concrete situations. Where the vocation is of exceptional importance to the state and where individual or other private effort would not suffice to provide educated workers, then collec-

tive action or public support is easily justified, as has long been the case in the training of military leaders, public school teachers, and other public servants, as well as, more recently, agricultural experts and industrial technicians.

Where a vocation has traditions of apprenticeship, public support of *extension* or *supplemental* vocation is easily enlisted; and where a vocation has had no such apprenticeship public support of basic vocational education can be procured, as in the case of commercial education.

But public support is with difficulty enlisted for those forms of basic vocational education in which apprenticeship has long prevailed and where it is believed it should prevail still. For this there are several contributing causes. Organized labor naturally favors *labor* or guild control of education through apprenticeship. Educators still have little confidence in their own ability to organize effective basic trade schools. The public looks askance at productive work as a means of education. Hence we have, as yet, very few examples of trade training at public expense that is genuinely basic; existing schools offer mostly either pre-apprenticeship instruction and training (in the strict sense of these words) or else *parallel* or *subsequent* extension technical instruction.

It is obvious also that the public is unwilling to support vocational education for those vocations, usually highly specialized and often apparently of the semi-skilled variety, in which large concerns are the chief employers. As noted elsewhere, the public vaguely feels that it is socially obligatory upon, as well as profitable for, these concerns "to train their own workers." This public attitude is reinforced naturally by educators, nearly all of whom feel that the obstacles to public administration of basic training for these vocations are almost insuperable.

For a number of years popular interest in public support of vocational education was most easily enlisted on behalf

of children or youths themselves and especially those whose poverty or lack of particular abilities early cause them to become misfits in, or truants from, public schools of general education. But the programs provided "to hold children longer in school," "to provide for the mechanically minded boy" to "fill the gap between fourteen to sixteen" or to help the "neglected groups" were usually conceived in a spirit of adherence to the panacea of "general" or at least "prevocational" education and they have probably borne very little fruit, and that of pretty sour quality.

But experience, experimentation, the awakening public conscience, better understanding of real educational values, and the war itself all seem to be working together to bring society to the point where it will freely support any kind and any amount of demonstrably genuine and functional vocational education which visibly contributes to the well-being of society, the democratic self-realization of all individuals, and which cannot be guaranteed by non-public agencies. The detailed applications of these principles to many vocations remain to be made. Shall we have publicly supported, basic vocational schools for cigarette makers? locomotive engineers? sea captains? hotel clerks? expert milkers? grocers' clerks? lawyers? Shall we seek to provide at public expense for the complete (*i.e.* to journeyman stage) vocational education of tailors? plumbers? pressmen? job printers? railway mail clerks? tugboat engineers? cutters in shoe factories? If, to people of certain types of ability and under certain economic necessities, sixty days of intensive training for factory operative specialties is relatively as important for vocational success and happiness in life as four years' training for the prospective engineer or physician, or two years for the prospective stenographer, or pharmacist, shall we provide it at public expense?

It will be evident to the student of educational policies that these problems of limitation to *kinds* and *degrees* of

vocational, resemble very closely similar problems in the fields of liberal and physical education. We now try to force on all certain minimum attainments in civic and cultural fields; but we also deny to large numbers, because of inferior ability or interest, opportunities to share in advanced forms of publicly supported cultural and civic education. Policies of different states differ somewhat, and everywhere they are growing more generous and wise; but limitations are still, and always will be, recognized.

Public Control. — It can be assumed at the outset that public control of privately supported vocational education is at present alien to American public policy. Where the state imposes minimum standards for practice (licensing, as in the case of medicine, law, engine-firing, electric installation, nursing, etc.) these naturally greatly affect standards of private education through apprenticeship or schools; but these conditions touch as yet only a few vocations.

Public control must be thought of, therefore, as a condition or accompaniment of public support. Several sets of problems arise in this connection. (*a*) Where different governmental areas — local or municipal, regional or state, and national — share in such support, how shall functions of control and direction be distributed? (*b*) Within any given area shall attempts be made to give special functions of control, by mandate or mere opportunity, to one set of interests in some way related to the particular vocation, education for which is in question — such as consumers (of its product), employers, employees? (*c*) Within any area is it desirable to unify the control and higher direction of all forms of publicly supported education, or is it best to create governmental agencies charged with responsibilities towards particular forms?

Local vs. Central Control. — In a number of states support of vocational education derives from three sources — district or municipality, state, and nation. Paralleling devel-

opment of this complex means of support have grown certain obvious tendencies in control. The local area initiates and actually administers schools; the state supervises, and, as a final condition of disapproval, withholds its contribution; and, similarly, the national authorities supervise work of the states, and as final and effective evidence of disapproval, withhold funds.

We here see in evolution administrative mechanisms which are probably sound in principle, although sometimes slow and cumbrous in operation. The local area is, normally, most cognizant of its own needs — immediate needs, at least. State and nation are best able to procure and organize the work of specialists. In general practice, local and central authorities arrive through conference at working policies and only very rarely will the local authorities refuse to " play," or the central authorities find it necessary to have recourse to the penalizing expedient of withholding funds.

All sorts of specific objections are raised to this distribution of control functions in practice. In America traditions of local self-government can easily persist along with entire willingness to share in subsidies from central sources. But it is certain that all sound governmental tendencies in this country are in the direction of providing that state and national grants of all sorts shall be accompanied by supervision sufficient to insure their proper and effective expenditure. On the other hand the freedom of the local community to " go alone " if it desires is not interfered with.

The fundamental weakness in this system of control will not be found in its immediate administration. For those kinds of vocational education that should be widely distributed and the need for which can easily be felt, the system may prove more effective and more democratic than any other. But it must be remembered that we shall yet require hundreds of forms of vocational education the need for which will not be intensely felt in any given locality,

nor can local initiative be found sufficient to organize it. For these forms the local area may often have to be not less than the state; and in many cases, even the state area is too small.

It is not improbable that we shall have to provide in the near future for gigantic schools wherein to train locomotive firemen and engineers. It would clearly be unprofitable to localize schools for this purpose in cities or even local railway distributing points. Probably it would be unwise to ask each state to establish such a school. Quite possibly the interest of economy and efficiency would best be served by having ten or fifteen such schools for the country as a whole, located at strategic railroad centers where abundant facilities for part-time practice could be available.

If we are to have comprehensive systems of vocational education, it is obvious therefore that provision must be made for initiation and control through very large areas in many cases. We may find ourselves able to rely very satisfactorily on local initiative for such forms as homemaking, farming, indoor salesmanship, and house carpentry. Local effort may also amply suffice to provide for highly localized industries — meat packing for Chicago, shoemaking for Brockton, steel mill work for Pittsburgh, textile work for Lowell and Philadelphia, pottery for Columbus, paper manufacturing for Holyoke, fruit packing for Stockton, automobile construction for Detroit. But in a wide range of other forms, perhaps national agencies may have to lead, as was, indeed, done in war time.

Advisory Oversight. — No substantial dissent is made to the principle that where public moneys are used to support vocational education the controlling agencies, local or central, should represent the people as a whole in their governing capacity. But in vocational, as in some other forms of special education (*e.g.* that of the blind, or the orphaned, and of immigrant adults) it is highly desirable somehow to

enlist the close coöperative oversight of persons peculiarly interested in any particular form. Considerations of vocational efficiency no less than that of expediency clearly dictate such action as an offset to the administrative ineffectiveness of the normal agencies of democratic government.

In practice this principle has long been accepted, but in ways which require modification for modern schemes of vocational education. Public boards to direct such institutions as agricultural colleges, war academies, normal schools, textile schools, and other special technical schools have usually been composed of men and women known to be specially interested in these respective forms of education. At times, indeed, the process of selection has been carried so far in this direction that the governing boards have tended to represent special or vested interests excessively.

As regards many forms of vocational education it is clear that, besides the collective interest of society in the welfare and civic development of the learners involved and also its collective interest as representing consumers, in the vocational output, there are two other interests closely concerned. In a constantly increasing proportion of cases, the vocational position of the worker for five to twenty years after entry upon work, if not for life, is that of an employee. His employers must assume large responsibilities for the organization and supervision of his work, for his by-education in the work itself, and for the determination of his share of the product. With the increasing intelligence of workers and their growing powers of concerted action it is to be desired and expected that employees will share with employers in discovering and applying principles controlling in these matters. But final decision will necessarily rest with those whose economic responsibilities for initiation are largest.

Hence employers are often the most competent factors in a given vocation to determine what are desirable and fea-

sible specific aims of vocational education for specific special fields. Educators schooled in the traditions of general education are usually suspicious of employers in general — partly because academic men do not easily learn the language of men schooled in material production, and partly because they mistrust the powers and intentions of men strong in executive qualities. But this very aloofness of attitude and remoteness of understanding constitute, often, the best of reasons why the traditional educator should force himself often to sit in consultation with men whose daily work has forced them into practical acquaintance with the conditions and results of vocational proficiency.

No less appreciative of the realities of a given vocation are the daily practitioners of the calling itself. Where sound conditions of apprenticeship have prevailed the qualified workers have themselves developed and upheld standards, which, notwithstanding monopolistic tendencies that have from time to time appeared, have enriched the world of craftsmanship.

How, then, can employers and employees, especially in the highly organized vocations, be brought into intimate relationship to vocational schools, as a means of making available their special knowledge, and of preventing the "academic" ignorance of laymen (including general educators) outside the vocation from rendering programs vague and ineffective? In some states the device has been tried of providing, in conjunction with a specific school or department, for the creation of advisory committees composed of representative employers and employees. In a very few cases these have worked well; but in many cases they have failed to function properly because of faulty administration. School boards, superintendents and even school directors, are prone to enter upon conferences with these advisers without adequate formulation of measures for consideration. They seem to expect advisory committees to be

prepared to *initiate* proposals. These are impracticable expectations. To render effective service these advisers should have laid before them in concrete detail *proposed* objectives, programs, estimates of results — what, in the business world is known as a "prospectus," with "specifications." The reactions of practical men to intelligibly presented plans of this sort are certain to be valuable to the school authorities; while the overcoming of prejudices and hastily formed opinions on the part of the advisers themselves will ultimately redound greatly to the strength of the school in the community.

Many problems of utilizing private and special knowledge in school administration remain yet to be worked out. Among them are many difficult ones in connection with part-time or coöperative education.

Part-time education, to be at all effective, requires that employers and educators coöperate intimately in formulating plans and in administration. Much of the part-time education now found is of low efficiency because no close coördination exists between school and shop work. Each follows its own channel; and nowhere do the channels come together.

Very recently a number of large manufacturers have established as private ventures, vestibule and upgrading schools. If these are to be extended, they should receive public support; and if they receive public support they must be under public control; but if that public control is not intimately and understandingly correlated with shop conditions, failure of the ventures is inevitable.

In some part-time plans the "coördinator" is made the link between the school and the shop, in a sense representing each. In one case the teacher of "technical studies" to boys becomes an assistant foreman in the shop.

"Unit" vs. "Dual" Control. — In the earlier stages of the establishment of vocational schools in a number of

states, legislatures created separate state governing or supervising bodies and permitted the similar erection of local authorities independent of those controlling regular schools. Fears soon developed that "dual" control would lead to harmful "dualisms" in educational administration.

Various historical and social conditions were involved. Historically it has been customary in America to create a special public administrative agency (*ad hoc* as the English describe it) for a new or exceptional type of education. As noted before, the practice has always prevailed of providing special and often local governing boards for agricultural colleges, state technical industrial schools, normal schools, reform schools, state universities, and the like. Within city areas colleges and some other municipal schools have been governed by their own boards.

When the movement for publicly supported industrial and agricultural schools of a practical character reached the point where legislation could be procured, the proponents of these new types of education were often convinced that the "regular" school authorities — boards no less than executives often — were hostile to the proposed forms of vocational training. In many cases there was good evidence that this hostility was not so much against the idea of vocational education as such, as it was against the practical proposals for application of these ideas. The "academic minds," long hostile to manual work, now directed their opposition to such vulgar means as teaching trades by shop practice, farming by working the soil or caring for domestic animals, and homemaking by actual "productive" work in homes.

Hence the conviction that the "infant industries of vocational education" must have protection among avowed friends if they were to have a fair start.

But the causes of the opposition to "dual" control involved much more than "academic" prejudices. If two forms of separately administered education are competing

for public funds, taxpayers and the public are distracted by the rival claims for recognition and support. It has also been feared that the prospects of "immediate returns" which the vocational school could hold out would lure students from the less visible "values" of general education.

As far as local administration is concerned, there is now little opposition to "unit" control in spite of doubts, sometimes, as to the actual interest of the academic minds in control in the promotion of genuine vocational education. State and national supervision naturally develop special agencies of oversight, but usually consolidated with those for other forms of education in their final control. The tendency is steadily towards the unification of ultimate supervision and stimulation in some single authority in the state and, where the optimum local areas for two or more forms of education are coterminous, for districts and municipalities as well.

III

Surveys. — The purposes of surveys for vocational education are of two kinds: (*a*) the determination of the need of particular types of vocational education, and the conditions of their provision; and (*b*) the effectiveness and economy of established types. For some years to come it is obvious that surveys of the second type will be less needed than those of the first.

Surveys initiated with a view to determining needs for vocational education can be of two very distinctive kinds, in answer respectively to the questions (*a*) what provision of opportunities for vocational training should be made in a given area for the youths and adults of that area; and (*b*) what provisions should be made for training persons to fit most effectively into going types of vocations? Since much of contemporary interest in vocational education has had its roots in the aspirations of social economists and educators,

it has been natural that several of the surveys heretofore made should have been directed primarily to the discovery of vocational opportunities. But surveys made from that point of departure have almost necessarily proven abortive; we as yet know too little about the ways and means of providing industrial and commercial education except for a bare score of callings. (It is noteworthy, for example, that in none of these surveys has it been possible to make detailed and workable suggestive plans for education for factory and salesmanship occupations in spite of the numerical supremacy of these two groups.)

For ordinary purposes, much the most effective method of vocational survey for purposes of laying foundations for educational policy and program, is that which starts with one definitive occupational field at a time. Fundamentally, such a survey requires that only a few definite points of attack be made:

1. What is the extent, general character and probable future of the vocation in question?
2. Are the methods by which at present persons are fitted for its pursuit (and at each of its levels or varieties) effective and economical from the standpoint of the individual, and socially sufficient from the standpoint of society, and the particular field of production operating in the service of society? And if not,
3. What are the administrative and pedagogic means and methods by which more effective vocational education can be provided?

Questions like the following will be found necessary for guidance in details:

1. Does the occupation require the methodical procedure of professional or trade school preparation?
2. Does the occupation lend itself to measurement of results in terms of learning capacities within four or five years after school stages of training have been completed?

3. Does the occupation present opportunities for specialized training towards foremanship, managership, or small capitalist operation?

(*a*) What are problems of the future of the capitalist manager or capitalist operator as found in the cases of farmer, small storekeeper, restaurant keeper, etc.?

4. Can the trade school procure definite connections with industry, so that if apprenticeship stages exist, definite provision can be made for correlating work of school with them?

5. If a professional calling, does it open opportunity for part time participation? If not, should practice stages intervene before final degree or diploma is awarded?

(*a*) Consider a general proposal that, except in schools doing full productive work in which quantitative as well as qualitative standards can be maintained, no diploma or degree shall issue until after a period of sufficient successful practice supervised by the training institution.

6. To what extent can any type of vocational school other than an extension school justify the maintenance of a curriculum predominantly technical in character?

7. Can the vocational school take a person of no experience in, or practical preparation for, the vocation, and set out to give him a part or whole of the equipment needed for its successful practice?

8. Should the school presuppose some practical experience upon which it undertakes to build, either additional practical capacity, or, more commonly, technical knowledge, that will be of value in the vocation or will lead to advancement in it?

(*a*) In any survey of a plan for vocational education for a given vocation, one of the first essential requisites is an analysis of all of the elements or factors entering into complete preparation for the vocation, in order that the apportionment may be made of the contributions expected suc-

cessively from early participation, systematic school education, formal apprenticeship, later experience, etc. From this study should be determined the contributions that can most effectively be made by the school, whether that be on a full-time or coöperative basis.

In the case of homemaking, some weight must undoubtedly be given the miscellaneous concrete experience obtained during the ages 6 to 12, or later, by ordinary participation in the home. Similar suggestions apply in the case of farmers' boys and any other occupation in which early helpful activities are possible.

Again, analysis of the kind suggested here should differentiate along the three lines of practical skill, technical knowledge, and social insight, in order that the maximum possible contributions of the school in each case can be ascertained.

9. Can vocational preparatory education, in a large number of cases, be carried forward completely under the auspices of a single agency in which few, if any, important coöperative adjustments must be made? Types are found in the normal school controlling its own practice school, the trade school with its own shops, the commercial school with its own productive commercial work (if any is employed), the medical college completely controlling its own hospitals, etc.

Procedures of the kind here suggested, starting either with the locally most extensive lines of productive work, or else with local lines in which the need for vocational education seems most urgent or else most practicable, could result in the course of a few years in provision of optimum opportunities for a majority of the rising generation. Then, and usually not until then, might a different type of survey be initiated with a view to discovering openings for marginal groups. But the fact should not be overlooked, at least for some years to come, that we have at best only very inade-

quate means and methods of planning such a survey, or of carrying its findings into serviceable application.

Probable Permanent Types of Organization of Vocational Education. — The following principles as to types of vocational education of probable permanency are submitted:

a. In many vocational fields we cannot trust to the methods of simple participation or even organized apprenticeship, to give society the vocational powers required in its members. Hence sooner or later vocational schools for nearly all types of callings will be provided.

b. The technical school, as offering extension courses for persons already possessed of a large degree of experience, now occupies a place of substantial and increasing importance. Its offerings of evening courses (or afternoon courses for homemakers), correspondence courses, "dull seasons" all-day courses (as now for farmers), or "short unit" full-time courses for operative specialists desiring to add a specific new form of mastery to their present equipment (as has happened so frequently in our ship-building campaign), may be expected to increase in variety, concreteness and purposiveness of organization, and usefulness in providing vocational extension for experienced workers.

c. But the technical school as a school of initial vocational education may be expected to disappear, except possibly in a few cases where the content of a vocation involves a very large proportion of abstract knowledge and can be effectively followed only by individuals possessing highly developed special endowments of mind, especially of an "abstract" character. Law schools, theological schools, and even some types of engineering schools, may conceivably remain long on the basis of "pure" technical schools, although the presumption is against the hypothesis, even in the case of these institutions. Without doubt present types of agricultural schools and colleges, commercial schools, homemaking courses, engineering colleges, technical high

schools, and the like, *in so far as they seek to minister to the needs of learners who have had no previous practical experience, the results of which may be purposefully used as a basis for the technical training given in the school,* will be replaced by a type of basic (not extension) vocational school, in which the provision of facilities for learning through practice of a kind closely akin to the practice required in the work-a-day world will constitute the central aim, the central problem of administration, and the most important concern when it comes to the testing of results.

d. Not only will vocational schools of the future tend steadily to approximate two, and only two, types according as they are responsible for either *basic* or only *extension* vocational education; in each case it is to be expected that the unfortunate duality which now exists between practical power of execution (skill) and technical knowledge in the earlier stages of the learning of an occupation will be at least modified. This constitutes, in programs of *basic* training for almost any vocation, a pedagogical problem of the first magnitude. In the case of *extension* teaching some progress has been made towards pedagogical synthesis of technical knowledge and practice by means of *short unit* courses so devised that when the learner, in his practical work, has reached the stage where he perceives the need of a unit of additional knowledge or skill, he can find almost exactly what he requires, in which case *pedagogic integration* is assured.

e. The tendency will be, without doubt, in most cases in the direction of segregating "units" of practical achievement — simple stages, easy processes, uncomplicated machines, readily mastered projects — for the beginner, and as progress in practical accomplishment is made in these, to provide closely related units of technical instruction, the connection of which with the practical work will be clearly evident to the learner. The system prevailing so often at

present, where practical work and technical training and instruction are both given by the school, of keeping the two strands almost completely separated will, of course, have to be modified. It is easily to be seen, for example, that little organic connection is now made between the technical studies and the practical work of such vocational schools as: medical colleges; normal schools; trade schools; agricultural schools with school farms; engineering schools (with vacation work). By means of what pedagogical devices this pedagogic unification can be accomplished, we do not now see, except in a few instances. Undoubtedly the "home project" in farming has shown large possibilities for agricultural education; and there seem to be no good reasons why the same device should not be applied successfully in homemaking education when once the need and desirability of basic vocational education for that field shall have been accepted.

f. Wherever practicable, the vocational school of the future will probably endeavor to provide that a maximum of the productive work used as training in practice shall be done in commercial establishments — that is, agencies organized primarily for production, instead of in productive establishments maintained by the school itself. But in many vocations such coöperation may not prove feasible; and in most cases it proves highly desirable that, before a learner is "placed out," he shall have been at least initiated into productive work in a school-controlled shop, office, factory, ship, or other productive agency. Probably exceptions to this principle can be made (as experience seems already to have shown) in the case of the farm and the home where subdivision of labor and overhead organization have not been carried so far as to make the reception of the beginner a difficult process. We cannot as yet, of course, predict the possibilities of the employment of either beginners, or of learners who have passed the early stages in the attain-

ment of practical experience, in productive establishments. At present, it appears that in many vocations coöperative arrangements could and will be made; that these will involve no "philanthropic" contribution on the part of employer; and that he will employ this labor at rates which will normally prove profitable to him, in view of the extraordinary "overhead" expense that may be involved in it. Those beginnings which have thus far proven successful also suggest the very great desirability of giving the learner as a wage whatever "net" value accrues from his work.

g. It is probable, too, that the time is not far distant when the documentary evidence given to the person completing a supposedly vocational course will be based upon the holder's tested powers of accomplishment under commercial conditions. The licenses now granted to firemen, pharmacists, opticians, etc., are supposed to attest standards of practical proficiency; as are, likewise, Civil Service ratings of stenographers, certain types of inspectors, etc. Theoretically there is no impracticability, and there is much social promise, in the proposal that in the not distant future, the approved diploma from any type of alleged vocational school will carry on its face evidence of the holder's practical proficiency.

Age Groupings. — In educational gatherings the question is often asked — "At what age should vocational education be commenced?" Usually, but not always, this question is put by educators whose study has not carried them to the point of thinking of vocational education in terms of known and individually considered vocations. They are still thinking of some vaguely abstract form of instruction or training which might be given to all pupils alike. To provide concrete thinking it is necessary to ask in return, "Do you mean for the vocation of physician? or stenographer? or locomotive engineer? or city school superintendent? or sea captain? or telegraph messenger boy? or homemaker? or plumber?"

The "Age at which vocational education should be commenced" is obviously dependent upon many factors. (*a*) What is the customary age at which workers are now usually accepted into the given vocation? (*b*) At what age, under conditions of vocational education provided in special schools, could workers best be inducted into the vocation? (*c*) What are, or what should be, the minimum requirements of non-vocational education to be imposed before the youth can elect to give his working hours to vocational education or practice? (*d*) To what extent and under what conditions is it profitable to devote the youth's working hours to a program of instruction and training partly liberal and partly vocational?

1. **Age of Effective Entrance.** — Custom dictates for most vocations an optimum time of entrance. Men rarely become "full responsibility" physicians under twenty-four; doffer boys under fourteen; farm hands under fifteen; locomotive engineers under twenty-five; school principals under twenty-eight; soldiers under nineteen; or telegraph messengers under fourteen.

Women rarely become fully approved nurses under twenty; high school teachers under twenty-two; homemakers under twenty-two; school principals under thirty; spinners under fifteen; salesgirls under sixteen; cash girls under fourteen; or waitresses under eighteen.

These lower limits are obviously dictated by several considerations, of which vocational skill is only one. A boy of sixteen could easily be trained in six months to drive a locomotive; but public opinion would not tolerate his being put in charge of a passenger train at that age. This vocation requires the sense of responsibility that only comes with age. In practice a man who is ultimately to be a locomotive engineer begins some form of railroad work at about sixteen. He progresses through several fairly distinct vocations, and if "upgrading" facilities are good, and he is the "right

stuff" he can get a passenger train place between twenty-five and thirty-five years of age.

Day telegraph messenger service seems well suited to boys between fifteen and seventeen. (Night service is now given only to men in some states, because of moral risks.) Boys and girls can often perform well "assistantship" tasks when they are not old enough to attempt, or skilled enough for, the performance of "full responsibility" vocations. Boys, even from twelve onwards, may well render delivery service for small stores, bundle carrying, doffing, and cattle herding. But in practice men must be twenty or more before they can be given responsibilities as clerks in grocery stores, farmers, or floormen.

The only way, therefore, to ascertain what is the most effective age for beginning vocational education is to start with a survey of a particular vocation. What is the usual minimum age at which people now become policemen, street car motormen, bank clerks of specified function, sailors, rural school teachers, glass blowers' assistants, farmers' hired men, journeymen printers? The next question is — how much time is normally required to train for each vocation, and is it not best that such training should be provided just before entry upon wage-earning in that vocation? Surely only some simple problems in subtraction would require solution if we possessed these facts. Occasionally, of course, we might find exceptions. It is well known that most women in urban environments do not begin "full responsibility" homemaking until about twenty-two to twenty-five years of age. But it is contended that if we are to give systematic education for this vocation we shall have to provide it for young persons between twelve and sixteen, in the majority of cases, if it is to be gotten at all. This may be only a counsel of expediency, however. No one would contend, probably, that if we could have the full working hours and active interest of a woman for one half

year to prepare her for the homemaking vocation, it would be better to take that time at sixteen, seven years in advance of her marriage, rather than at twenty-two just prior to her marriage.

Again, it is sometimes contended that if a person is to aspire to some vocation of "leadership," he should receive some preparation therefor even during the years devoted to preparation for his initial vocation. But here again considerations of pure expediency probably now dictate recommendations.

2. **Changing Ages of Admission.** — Two opposed tendencies are evident in prevailing ages of admission to vocational practice when schools of basic vocational education become available. The slow, cumbersome, and ill-directed processes of by-education are shortened and the proficiency of the individual greatly increased; but, on the other hand, social requirements for maturity, general education, and the like are increased. Vocational schools have so improved the training of nurses, elementary school teachers, dentists, pharmacists, stenographers, and assayers that very young people could easily qualify for these callings if general standards had remained what they were when transitions from apprenticeship to school training took place. But these standards have themselves steadily risen.

It has sometimes been thought that trade training, if accomplished in schools of basic vocational education rather than through apprenticeship, would result in bringing men to the stage of journeymanship much earlier than has historically been the case. Doubtless it would if other requirements did not change. But even the age of entry upon apprenticeship has been steadily rising during the last century for all, or nearly all, trades. It is doubtful if the substitution of school training even for all of apprenticeship in the craft trades (of which complete training probably no examples can yet be found) would permanently lower the age of entry upon the journeymanship stage.

It is hard to discover any vocation in which the effective age of entrance would be lowered by provision of direct vocational education. But it must be recognized that modern methods of manufacture, selling, office work and transportation offer endless new varieties of possible juvenile employment (for present purposes it would be well to regard any occupation customarily open to untrained workers under twenty years of age in large numbers as a juvenile occupation). For many of these a few weeks or at most a few months specialized training would often be highly profitable. The results, superficially considered, might seem to involve a lowering of the age of entrance.

3. **Minimum Requirements of General Education.** — No one now disputes the right of society to require that each individual shall be guaranteed opportunities for at least a minimum general education. Equally it is agreed that society has the right to require that each individual shall give a stated minimum of time to school attendance and shall, if humanly practicable, reach a minimum standard of proficiency.

But there exists as yet no substantial agreement on minimum standards. Several factors must be considered. What is a reasonable amount, and what the general character, of the non-vocational education that society requires? What, in the case of different classes of individuals, is the amount of general education they can profitably take? To what extent, at the least, should parents be expected to support their children exclusively as consumers? Is it expedient that society, in some collective capacity, assist parents in the support of their children while the latter are completing expected requirements in general education?

Educators have not yet so established the valid objectives of general education beyond the primary grades that minimum standards can be defined in terms of their actual worth. We can easily insist on minimum essentials in read-

ing, writing, spelling, and perhaps arithmetic; but when we say that fifth grade or eighth grade standards must be met we are imposing requirements in terms of purely conventional norms, the validity of which is as yet far from having been determined. Certainly before even the dull and uninterested of our youth are permitted to leave behind them all opportunities for general education (physical, social, and cultural) they should have reached required levels and varieties of *knowledge* and *habit* (would that we could say *appreciation* and *ideal* as well) in hygiene, civics, geography, literature, American history, and English speech. But how can we define, let alone really evaluate, these requirements? The problem is still before all educators who are not to be contented with purely traditional standards. For the present the low limits in our progressive states are set at the age of fourteen and the fifth grade. In other words, no one may leave the general school (or enter a vocational school) until after the fourteenth birthday has been reached, and the fifth grade passed. But it is felt by many that these requirements are too low. Too low for what? For the individual? or for society? Faith answers, " for both," but faith is a poor judge in these matters. It is too apt to be charged with soft sentimentalism.

One aspect of the difficulty is found in our inability as yet to say how much education, at least as defined in terms of school studies, given individuals can " take on." A large percentage of retarded pupils now constitute a mournful reality in our elementary schools. What would or could these get from longer attendance? It is of doubtful worth, either to society or to the individuals concerned, that a lot of slow, uninterested pupils be forced to attend school between the ages of fourteen and sixteen unless the school can give them some kind of profitable training and instruction (that is, for civic and cultural purposes).

Before we can dogmatically decide upon minimum stand-

ards of general education required to be met before vocational specialization is begun, we must, clearly, work towards better determination of valid objectives, so defined as to indicate desirable and practicable grades as related to known degrees of native ability or learning power.

But there are other very important factors which must affect standards of minimum general education. Society is now organized on the basis of parental support of children. The American standard of living requires that the father, and, until the children can help, the father only, shall be the wage-earner for the family group. The size of the normal family is decreasing, but social economists tell us that in social groups that are not undergoing social degeneration the normal family must contain from four to six children. If the father must support these wholly as consumers until, say fourteen years of age, the measure of his economic responsibility is easily computed. Farmers, small store keepers, and a few others are still able to enlist the economic coöperation of children from six to fifteen years of age outside of school hours; but other workers cannot. What shall determine reasonable limits to the economic responsibilities of parents under these conditions? We may not, except at our peril, either unduly sacrifice the size of the family or impose upon the burden-bearing powers of the father.

If we are ready to adopt a wholly new type of social policy, then, of course, the problem alters fundamentally. We may collectively assist parents — all, or at least those most needing it — to carry the burden of non-productive children giving their working hours to school between the ages of fourteen and eighteen. At least we might do it for the families of most promising children — as is sometimes done in England by means of "supporting" scholarships. But here we enter upon very new lines of public policy, before undertaking which we certainly need better estimates

than we now possess of the actual values, to the individual and to society, of the kinds of education, cultural, civic, and vocational, which we can give to different classes of youth from fourteen years of age upward.

4. **General and Vocational Education Combined.** — Finally it is clear that the proper "age of beginning" vocational education is also affected by our policies towards the separation or combination of the two types of objectives. We can, for practical purposes, assume that each youth has available for *educational work* between the ages of fourteen and twenty-two from five to eight hours daily, for two hundred to three hundred days yearly. These *working hours* can be given either to vocational education, general education, vocational productive practice, or a combination of the three, or any two. Outside of working hours the youth has leisure hours for physical, cultural, and social recreation, and for rest. In his leisure hours he will continue to *grow* physically, culturally, and socially; and these hours can be used to further liberal education of the "beta" or B class type.

Let us assume the case of a youth normally due to enter, at the age of twenty, a vocation for which two years of full "working" time, basic school vocational education are ordinarily required. Among possible courses open to him the following are typical. He may devote all his working time up to the age of eighteen to procuring a general education and then give his full time for two years to obtaining a vocational education. Or, between the ages of sixteen and twenty, he may give half his time to vocational, and half to general education. Under the first conditions, he would begin what would be called his vocational education at eighteen; under the second conditions, at sixteen.

Which course will give best results? Obviously we need to know what we mean by "best," and how we rank the possible vocational education of these years with general educa-

tion in individual and social values. The present writer is emphatically of the opinion that when we shall have actually determined the valid objectives of school vocational education, for such callings as those of the dentist, shoe salesman, type B general farmer, elementary school teacher, plumber, machine shop foreman, house carpenter, cotton mill weaver, and hundreds of others, we shall find it impracticable to provide that working hours shall be used on a "blended" program. We shall discover that acceptable results can be procured only by programs providing for close concentration and part-time adjustments with productive work and involving a corresponding shortening of the period to be devoted exclusively to vocational education. A similar requirement will be that as much time as practicable be reserved for full-time liberal education.

IV

Labor Unions and Vocational Education. — To educators as well as laymen, the probable future development of vocational schools seems to be very much conditioned by the attitude of "labor," organized and unorganized. It is submitted that experience to date justifies the following conclusions:

1. The general attitude of the best informed leaders of organized labor is clearly expressed in the following statement made by President Gompers (quoted from *Manual Training and Vocational Education Magazine,* Vol. 16, p. 329):

"In 1904 another committee on education was appointed, and again in 1905 another committee, and again in 1906. In 1907 the A. F. of L. at its annual convention resolved that 'we do endorse any policy or any society (this I may state included and had special reference to the National Society for the Promotion of Industrial Education) or association, having for its object the raising of the standard of industrial education and the teaching of the higher technic of our various industries.'

"The committee to which this resolution was referred reported it 'decided to record itself in favor of the best opportunities for the most complete and best industrial and technical training obtainable,' and it recommended an investigation of industrial school systems.

"In 1906 the committee on education attested 'with satisfaction the splendid progress accomplished by the Executive Council along the lines of industrial education,' and submitted to the convention a set of resolutions in which it stated that 'industrial education is necessary and inevitable for the progress of an industrial people.'

"Industrial education was before the convention of 1909, at which time I myself stated in my report that the A. F. of L. favored public industrial education, and opposed only narrowly specialized training under the control of private interests. Organized labor has always opposed and will continue to oppose sham industrial education, whether at public or private expense. It has opposed and will continue to oppose that superficial training which confers no substantial benefit upon the worker, which does not make him a craftsman, but only an interloper, who may be available in times of crisis, perhaps, as a strike breaker, but not as a trained artisan for industrial service at other times. Industrial education must train men for work, not for private and sinister corporation purposes.

"I refer to this by way of explaining what it is that has at times in the past aroused labor's opposition to what has been unfairly called industrial education. It will be found that wherever labor has opposed what has been put forth as industrial education, the enterprise called industrial education has been something entirely different from what Richmond is instituting in its public school to-day.

"To the 1909 convention of the American Federation of Labor I took pleasure in submitting this: 'That since technical education of the workers in trade and industry is a public necessity it should not be a private, but a public function, conducted by the public and the expense involved at public cost.' You people in Richmond are doing to-day precisely what the committee of the A. F. of L. recommended five years ago should be done.

"In 1911 the A. F. of L. came forward in support of a bill in Congress providing for national aid in establishing vocational education in the public schools of the country. Since that date up to the present time the A. F. of L. has consistently, persistently, and unremittingly advocated the establishment of industrial education in the public schools."

2. But, in the actual processes of establishing vocational schools in a given community or state, opposition is frequently encountered, due to the following causes:

a. Employees suspect that employers are interested in vocational training primarily to the end of making available

a supply of labor to be used in time of strike or other difficulty.

b. Where a trade is in process of decomposition, specialized processes being substituted for "all-round" processes — carpentry in large centers, printing (of books and newspapers), clothing making, machine shop practice, glass manufacture, and many others — organized trade workers greatly fear the employment of "short" intensive courses in vocational schools to produce specialist operatives who will take work at reduced wages.

c. When educators have succeeded in establishing in a given community one or a few types of apparently successful vocational training, there is danger that an excessive number of learners will crowd into these lines, and so greatly disturb conditions in that center.

d. Laborers in skilled trades often allege that the vocational school, as thus far developed, cannot teach skills according to desirable standards of efficiency as maintained by these trades.

3. But labor unions have almost never opposed establishment of *extension* instruction or training for persons already employed as apprentices or assistants. Opposition is expressed chiefly against trade training that precedes apprenticeship.

4. Supporters of vocational education often urge laborers to second their efforts on the ground that the children of the laborers themselves will be the chief beneficiaries of free opportunities for vocational training. But these well-meant suggestions often fail to elicit sympathetic response for the reason that very frequently artisan and other organized workers do not desire their children to follow occupationally in the footsteps of their fathers. To a large extent in America, and in fact as part of what "Americanism" means to many in the way of freedom of opportunity to advance, parents desire their sons and daughters, the more capable at

least, to work into "higher" or "better" occupations than those followed by their parents. Unskilled manual workers try to get their children into skilled industrial or semi-skilled commercial occupations; skilled industrial workers aspire to have their children in commercial occupations, teaching, and lower grades of public service; while prosperous farmers, artisans, and commercial workers develop ambitions that their most capable children shall prepare for the professions or for the more profitable commercial callings. Hence the appeal to organized laborers to consider their own children often fails of response; they *have* considered their own children, but not as candidates for their fathers' kinds of vocations.

5. Notwithstanding the occasional selfishness or panic of organized labor, it is probable that when a sincere, well-planned, and properly supervised program of vocational education shall have been evolved in a community, leading representatives of labor having been freely consulted in the process, such labor will not persist in opposition. As a rule the civic interest and Americanism of really influential labor men is more basic than their specific devotion to unionism or their natural desires artificially to protect their own field of employment.

Disposal of Product. — The ideal vocational school should, in the opinion of best authorities, have its students working from the start on a commercial product, control of which lies wholly within the school. But, obviously, the practicability of this will vary greatly according to the vocation for which training is being given.

Where the possible product is of a kind that can profitably be produced in small shops it is easy for the school to equip and maintain such a shop of its own. This should be easy in such fields as the manufacturing of children's and men's clothing, fruit packing, furniture making, shoemaking, printing, and various forms of repair work, —

shoe, automobile, trunk, blacksmithing, etc. But where manufacture has developed a very large and costly organization as the productive unit of maximum effectiveness it may prove beyond the powers of the school to provide its own plant. No school, probably, could have its own shop for the manufacture of steel rails, cannon, automobiles, locomotives, ships, glass, or cement. It is questionable whether a school could manage successfully in the production of watches, pottery, brick, electric appliances, leather, packed meats, cotton cloth, jewelry, books and newspapers, and pressed metal ware. It would probably not prove feasible for a vocational school for the railway trades to own its own railroad in competition wtih private enterprise, but if the government were the controlling agency in railway traffic certain sections or branches of the system of a given area could be transferred to the control of vocational schools whereon commercial service could be rendered.

In farming, fishing, coal-mining, and ship transportation a vocational school can certainly provide the management to make commercially successful the farms, fishing equipment, coal mines, and ships that such schools might own and use. That examples of such control in the past have not always proven successful cannot be denied; and that the attempts of vocational schools to manage these large enterprises will always be accompanied by considerable risks, is unquestionable. But, in some cases at least, no satisfactory alternative may be found. The United States government, in providing vocational schools for aviators, has not hesitated to employ extensive equipment, although, of course, it has been under no obligation to deliver a commercial output as an immediate by-product of its training processes.

In house carpentry and probably in other trades of building or installation — including road building, forestation, and under some circumstances, conceivably, boat building, street paving, orchard planting, etc. — experience seems to

have shown that if a "revolving" fund is given the school wherewith it may purchase the needed land, materials, and tools required to erect a house (or build a boat, or section of road, plant an orchard, etc.), after which the finished product is sold and the revolving fund replenished from the proceeds, most satisfactory results will be secured. Here again, obviously, very good management is essential but the burden of such management is not an undesirable or unprofitable one to impose upon the genuine vocational school.

Where productive enterprise is still conducted on a small scale — farming, gardening, stockraising, homemaking, child nursing, cooking, laundry work, small store retail selling, and especially where the learners are usually able to work with equipment belonging to parents — it is doubtful whether the school should try to conduct independent productive enterprises. In these cases the best work of the school will probably be accomplished by providing for the organization of productive work at the home or at a place of "apprentice" employment — *e.g.* child nursing or laundry — and then linking up technical instruction, on a part-time basis, with such home practice. Certainly this method gives largest promise in agricultural education and, obviously, homemaking offers the most extensive field for its development.

Proceeds from Productive Work. — In the administration of vocational schools where a commercial product is made and sold, the disposition of the proceeds involves many knotty problems. The following are submitted as essential principles:

1. It is freely accepted that all sound vocational education involves the doing of concrete productive work, using for this purpose the appropriate special equipment and materials suited to the trade being learned. Examples: (*a*) A boy learning agriculture must raise a valuable product from the soil, using farmers' tools. (*b*) A boy learning print-

ing should individually, or as a member of a group, do a substantial amount of printing. (*c*) A girl learning cooking as one of the arts of homemaking should prepare substantial amounts of valuable food, using kitchen, kitchen equipment, and food materials.

2. Productive work in a vocational school is never a primary end in itself. Education in the occupation concerned is the primary end. Productive work is to be regarded as a by-product, and a necessary by-product. It cannot, however, be truly productive work unless it has value, unless it is capable of being sold. Make-believe work, toys, and the like, do not constitute true productive work. It is not expected, of course, that the productive work produced by learners will be of first quality. On the other hand, it cannot be tolerated that it should be of unsalable quality.

3. The time of teachers or pupils in State-aided vocational schools should never be devoted to productive work for its own sake. To do this involves a misdirection of State and local money. School authorities must decide when the law of diminishing returns operates as regards education through productive work, and terminate such work at this point. Hence it may always be assumed that the productive work of a properly managed vocational school will be essentially a by-product of educational processes.

4. The factors of cost in productive work may be considered under the following heads: (*a*) The equipment for technical instruction, such as school buildings and general equipment, library books, etc. (*b*) Instruction, and instructor's supervision of productive work. (*c*) The materials and special tools for productive work; for example: Land, horses, hand tools, seed, etc., for gardening; paper, printing presses, ink, etc., for printing; lumber, planing machines, etc., for cabinet making. (*d*) Special equipment. (*e*) The labor of pupils.

5. The special equipment and materials used in produc-

tive work may be supplied from the following sources: (*a*) The pupil, or the pupil's family, as when a boy uses home land and tools for farming; when a girl uses home kitchen, equipment and foodstuff for cooking. (*b*) The agencies maintaining the school, — the school acting as custodian and trustee. For example: Community and state, or either, may provide land for farming, domestic animals for plowing or dairying, etc.; kitchen equipment for commercial cooking; printing shop for printing, etc. (*c*) Private parties for part-time work. Examples: Owners of machine shop offer equipment and tools for pupils to work; owners of farms offer land and equipment for gardening, etc.

6. In determining ownership of productive work, it may be assumed that community and state maintaining vocational schools will not charge against productive work either general equipment for technical instruction, or instruction, including instructional supervision of pupil's work. Hence the two legitimate charges against productive work will be for (*a*) materials and special equipment used in productive work, and (*b*) labor of pupils.

7. On the other hand, it should be recognized that, by custom and sound theory, the learner himself has no necessary claim on any part of his productive work. He is seeking an education. Under an apprenticeship he or his parents often pay for such education and get no return for immediate productive work. In the older professional vocational schools the learner pays and gets no direct return. Hence it would not be inexpedient for state and community maintaining vocational schools to insist that any surplus of value created by productive work after cost of materials and special equipment has been met, should be retained by state and community.

8. But it may prove expedient, pedagogically, to allow pupils to share, under some conditions, in part or all of the products of their productive work. This should be determined by experience. The following are special cases:

9. Where the pupil or his parents supply substantially all of the materials and special equipment, the pupil and his parents might well absorb the surplus value. For example, a boy obtains from his father land, tools, seed, etc., for gardening; a girl obtains from her mother kitchen equipment, foodstuffs, etc., for cooking; a girl obtains for herself, or in her home, dress goods, sewing machine, etc., for dressmaking.

In all these cases it might prove expedient for a pupil to retain net value of product created.

10. An employer offers shops and equipment for industrial education. He is entitled, of course, to costs of materials, fair rent for equipment, and usual managerial profits. A surplus over might be returned, in the shape of wages, to the pupils, or net product might be divided between pupils and school (it being understood, of course, that the school is regarded only as trustee, it having been assumed at the start that the school has no inherent right as a definitive organization to any share in productive work).

11. When the school itself undertakes productive work, the value created does not belong to the school but to the agencies maintaining the school, the school acting as trustee. Hence, out of value of product may be paid: (*a*) Cost of materials (returned to school appropriation from which payments have been made); (*b*) Rent, to community for special equipment (as distinguished from general instructional equipment) for particular work; (*c*) Wages to pupils; (*d*) Surplus, divided between agencies maintaining instruction.

12. It has been urged, and there are precedents for the following claims under some circumstances where materials and special equipment are supplied by or through the school: (*a*) That the pupil might retain the product created by himself. (This has frequently been done in manual training and cooking schools. In industrial schools it may appear

desirable that it should be done in the case of those wood products, like furniture, which fit easily into the home, or clothing, which could be used by the family, or even agricultural products raised on the school farm.) (*b*) That the valuable product should be retained by the school itself, as a part of its upbuilding equipment. (*c*) That the valuable product should be retained by the city or town maintaining the school.

13. As regards retention of product by pupils, in case materials and equipment are supplied by or through the school, the following are grounds for believing it inexpedient and undesirable. (*a*) There is no necessary relationship between factors of cost of materials (including tools used) and labor of pupils, in the value of product. Under some circumstances the value of the materials may constitute 75% or 80% of the value of a product, — under others, only 10% or 15%. If the pupils retain product, the temptation is to exploit the school by asking for more valuable materials. (*b*) In only a few lines of productive work is the product itself of any value to the pupil. Rarely in electrical work, house carpentry, printing, machine shop practice, pattern making, and numerous other trades, can the pupil use the product. Examples of valuable products created, which pupils can use, as thus far known, are found chiefly in cabinet-making and dressmaking. Cabinet-making is still closely allied to manual training, and it is not certain that much of the work done in the study is truly vocational. (*c*) In view of the uncertainty as to whether pupils can use product, if practice is followed of giving pupil product under some instances, injustice is done to other pupils. If pupils are to share in values created by them, a uniform policy must be followed by which all pupils, in all lines of work, should share equally, unless it can be shown that pedagogic incentive is much more needed in some lines than others, which is doubtful. (*d*) Fundamentally, the chief objection to

pupils sharing in work is that the whole thing is put on the basis of manual training, and not on the basis of the true productive shop. In the commercial shop workers never take away the product. If they want samples, they must buy them in the market, as other people.

14. It is undesirable that the school should absorb value created through productive work, for the reason, chiefly, that this would put a constant premium upon repair work and adding to equipment in the school, instead of compelling the school to produce for a market and to meet the conditions of the market. Patch-work construction about the school often comes perilously near to the old exercise method, where students built little brick walls, or set up dummy walls for electrical apparatus, and then tore them down again. Furthermore, not all lines of trade give work that can be used in the school.

15. It is undesirable, also, that the community maintaining the school should absorb value of product created, except a due share for rent of special equipment supplied by community only. Town and state should create a revolving fund, and town and state should share in net returns from productive work, even if this operates towards reduction of cost of instruction.

16. Hence, the simple principles to be followed in reimbursement might be the following: (*a*) Special equipment for productive work shall be supplied by town. (*b*) All materials to be consumed in productive work shall be supplied from the maintenance fund. (*c*) The school shall be regarded as the holder or trustee on behalf of the town and state, of all values created by productive work. (*d*) Products created by productive work may be sold to: (1) pupils, (2) pupils' families, (3) school, (4) town, or (5) private parties. But in all cases these must be regarded as buyers on an equal footing. A market price must be established for the product, which is a fair price, quality being consid-

ered, but not of such a nature as to disturb market levels of price.

17. The proceeds of productive work shall be divided as follows: (*a*) Rent may be paid to the town for special equipment used. (*b*) Wages may, if desired, be paid to pupils on the basis of agreed-upon terms. (*c*) Net remaining amount shall be credited equally to State and town, as co-partners in maintaining the school.

Coöperative Preparatory Vocational Education. — Very great difficulties will always be encountered by vocational preparatory (*i.e.* basic vocational) schools in providing practice work on a commercial basis. A fully equipped school for this purpose will usually involve large expenditures of capital for equipment and endless difficulties of entry of product into commercial markets. Where the school is training for public service, as in army, navy, teaching, experiment station service in higher phases of agriculture, etc., difficulties are not so great.

Hence wherever practicable, vocational education should be organized on coöperative basis, the school giving those phases, technical and social especially, for which it is peculiarly fitted, and the student obtaining practical experience under commercial conditions. By almost universal consent, this represents pedagogical practice of maximum potency, if coöperative arrangements can be effectively made. But such coöperation will involve great difficulties, unless certain types of organization are effected.

1. Experience thus far seems to indicate that under the following conditions coöperation is most easily practicable:

(*a*) Where a farm is owned by an individual farmer, not working in a definite organization, the detachment of sufficient land and equipment for a comparatively practicable farm for the boy seems to be feasible.

(*b*) Where an industry or commercial establishment is managed on a very large scale so that space, equipment, and

even supervision can be detached in sufficient quantity to justify the maintenance of a class of pupils, here again, cooperative arrangements are easily feasible.

(*c*) In vocational homemaking, use of the girl's home for vocational purposes ought to prove entirely practicable.

2. Under the following conditions, coöperative work thus far seems to be fraught with much difficulty:

(*a*) Where a highly organized industry cannot afford to detach separate space, equipment, and supervision, for a vocational class, and hence where school pupils, if introduced at all, must be introduced as individuals alongside of experienced workers, thus greatly complicating supervision.

(*b*) The teacher coming from a public school system, and being obliged to take charge of a room rather than serve as an assistant foreman.

(*c*) A boy, not the son of a farmer, having to be placed on a farm as a laborer, in which case unintelligent production on gang labor basis may result.

We need detailed analyses of coöperative possibilities under such conditions as presented by: a sailing ship; a steamer; freight-train service; banking houses; small stores; department stores; hotels; automobile driving; mining; highly organized agriculture; skilled building trades, etc.

3. The following are essential conditions to effective coöperative vocational education:

(*a*) From the outset the general pedagogical plan of advancement, sequences of tasks, adjustment of technical to practice work, must be provided by the school itself.

(*b*) The schools should give a short introductory period of practice in order to minimize difficulties of supervision on the part of coördinators or shop foremen.

(*c*) The schools should also take charge of successive advancement in stages and, if necessary, give short introductory practice at outset of each.

(*d*) No coöperation should be asked for from productive

agencies unless it can be achieved without economic sacrifice, taking account of overhead service, on their part. Any other proposal is uneconomic, and, in the long run, destined to failure.

These conditions require concrete analysis from the standpoint of agriculture, counter salesmanship, field salesmanship, secretarial work, house carpentry, the printing shop, printing specialties, engine driving, engine firing, stationary engineer, etc.

Preapprenticeship. — Where vocational education for organized trades having well-developed apprenticeship does not appear to be feasible, the suggestion naturally arises as to why a so-called vocational school should not undertake certain preapprenticeship training which will almost inevitably be along technical rather than practical lines. The writer is unable to see why, where apprenticeship is well organized, any school vocational education should be required under the head of preapprenticeship. Very much better that the learner should formally enter early upon his apprenticeship, after which the vocational school should supplement by giving opportunities for extension teaching.

At the present time there is very much needed an analysis of all of those industrial pursuits for which apprenticeship is still an alleged possibility. It will be found, probably, that not only is apprenticeship declining in the main, but that the very conditions which once made apprenticeship learning practicable are themselves changing.

Intensive short course work will serve the needs of a vastly greater number than can ever profit from systematic apprenticeship teaching, at least so far as most highly organized modern industries are concerned.

A somewhat illusory objective often urged in connection with so-called preapprenticeship training is that of holding the pupils longer in school. This is not a worthy objective in and of itself. Pupils should be urged to stay in school

beyond the compulsory period only in case it is evident that the school has something of substantial profit to offer them. It will be found in many cases that the period of prolonged attendance, especially on the part of pupils somewhat retarded, becomes a period of semi-idleness in which habits of inattention and half-hearted work formed are not offset by vigorous play or other spontaneous activity.

But, as stated elsewhere, it is highly desirable that throughout the junior high school period and later if needed, offerings of vigorous practical arts work should be made, not designed necessarily to utilize vocational motives, nor to produce anything more than a very moderate degree of vocational guidance, but primarily for the purpose of insuring maximum "general" development.

The Continuation School. — In a few American states, we now find beginnings of the continuation school, school attendance within the working day being called for to an extent of from four to eight hours weekly. . From the standpoint of sound educational theory, there can be little doubt that the future holds in store very great opportunities for the development of continuation school instruction and training.

It should be understood that German experience in the development of continuation schools will not necessarily serve to shed light on American problems. European continuation schools, in large measure, evolved from the attempts of guilds and employers' organizations to provide, under school conditions, certain forms of education which they were obliged to give as part of apprenticeship. The first continuation classes were held frequently on Sundays in order to give employed children an opportunity to acquire the knowledge which was insisted on under conditions of apprenticeship.

In America, many new conditions must be encountered. It is by no means yet clear as to how far industry can adapt

itself to conditions where children are away from work from four to eight hours weekly.

Furthermore, programs of continuation school instruction are still matters of experimentation. That a small part of the education to be given can be of definitely vocational character is probably true; but for the majority of pupils, it is certain that only a more general form of liberal education, utilizing to the utmost the practical experience that the children are obtaining, can be devised.

The successful prosecution of any form of continuation work involves special equipment of shops, laboratories, and especially cases where work may be stored during the absence of the class.

Furthermore, in certain fields of cultural and civic education, the continuation school should also make a definite new start, connecting such work with the practical experience being obtained by the learner.

The ideal towards which the continuation school must strive is to be found in half-time school attendance from 14 to 18 years, during which abundant opportunity shall be given for "short course" introduction to new occupations or for short course transition from lower to higher levels in occupations.

Specially trained teachers — preferably teachers who have had some years' experience in day schools, after which they have taken the equivalent of at least one-half year's full time "graduate" or special training for this work — will be indispensable to the success of a continuation school program. In general, only men should teach the boys, and women the girls.

Continuation Schools should be defined to include only schools on which attendance is compulsory for a minimum of a stated number of hours per week within the ordinary working day of young persons regularly employed gainfully. Hence evening schools, part-time vocational schools

in which pupils are working in shops to obtain vocational experience, or short course schools for voluntary attendance are *not* continuation schools. It will be here assumed that a minimum program of continuation school attendance requires at least four hours weekly for forty weeks yearly between the ages of 14–16.

Courses offered in continuation schools may be of one or more of several kinds, — physical, cultural, social, basic vocational or extension vocational. It may be assumed practically that *extension* vocational education in continuation classes is based upon the experience obtained during the day in wage-earning work.

Vocational Aims. — To what extent will it prove practicable in practice to offer vocational training in continuation schools to youths between fourteen and sixteen? More adequate analysis of the experience of the German states, and of Denmark, Wisconsin, and Pennsylvania is required before we can answer this question with confidence; but it is the writer's present conviction that such opportunities will be found to be fewer than has been supposed. The reasons for this supposition are these: The vocations commonly followed by youths from 14–16 and to an increasing extent from 16–18 are essentially *juvenile* occupations — that is, occupations that are only suited to juvenile workers and that are not the normal introductory stages of vocations to be followed by adults. This is especially the case with the highly specialized industrial and commercial vocations. Assistant homemaking is rarely an organized wage-earning calling for girls from 14–16 and it is not yet certain whether wage-earning occupations will be available in agriculture for boys or girls of these years. Probably small-store merchandising offers to-day the most promising field of wage-earning employment for youngsters desirous of following juvenile work into related manhood stages. For young store workers, therefore, whether employed as deliv-

ery boys, assistant sellers, or in other capacities, surveys may show that continuation school instruction of an extension vocational character may well be profitable.

To what extent and for what vocations can *basic* vocational education be offered to advantage? Our knowledge of the vocations available and the most effective means of training therefor is altogether insufficient to say, but this prediction may be justified. Where systems of *basic* vocational training on a four to eight hour weekly schedule are brought into competition with full-time, short course vocational education, the latter will generally win popular approval and support. Even eight hours weekly for forty weeks could only give the same amount of time that eight hours daily would give in forty days. Most young workers of families having American standards of living will be found able to discontinue wage-earning for thirty to sixty days if thereby they can be assured of effective training for higher levels of productive work. It is not impossible, indeed, that once legislation assures a working day of moderate length to young workers, the compulsory continuation school attendance which will probably soon be required in all states up to and including even eighteen years of age will be made so flexible that the required hours of attendance can be met in twenty days of eight hours each as a minimum, thirty days of six hours each, or forty days of four hours each. This will permit opportunities for intensive short course training where it is desired to achieve definite forms of vocational competency.

It is probable that the time of continuation school attendance between the ages of 14 and 16 will be utilized chiefly for purposes of liberal, cultural, and social education. With the practical experience obtained daily by young wage-workers, even four hours weekly can be made of great service in ripening and extending general education. To some extent, too, this time can be well used for purposes of physical

education; but for that purpose we shall need programs and teachers very different from those now available.

Compulsory Vocational Education. — Even when it is urged that school attendance on a full-time or part-time basis shall be made obligatory up to eighteen years of age, it is not yet suggested that *vocational education* shall be made obligatory. Our knowledge of the desirable and possible objectives of vocational education is too vague as yet for that. What are principles of desirable and expedient action as regards obligatory vocational education? It is now regarded as no undue infringement of individual rights to compel acquisition of education in *literacy*. Will a similar social attitude ultimately be taken as respects minimum vocational competency? The following considerations are important:

1. The primary object of the state or of society in its collective capacity in promoting effective vocational education may be considered to be the safety of the state itself. But the security and effectiveness of the state can be achieved only by means of individuals who are in themselves effective physically, vocationally, civically, and culturally. Furthermore, the function of the state, in the last analysis, is the promotion of the well-being of the individuals composing it, and under these circumstances, vocational education may be considered also from the standpoint of its possible contributions to individual well-being.

In promoting the well-being of individuals, it is a fundamental principle that state action or other corporate action takes place only when the competency of the individual himself or of those immediately responsible for him proves insufficient to guarantee an optimum of the conditions making for such well-being. By universal consent, then, the state seeks to guarantee a protected childhood to every person born into society, this protection extending even to the point of removing the child from his parents or natural guardians

in case their incompetency can be established. The ideal of a protected childhood is also realized through compulsory education, through prohibition of labor of young people except under stated conditions, and through guarantee of certain opportunities for growth and development such as playgrounds and freedom of movement.

It now becomes public policy also to include under the general designation of a protected childhood such a start towards economic independence as the state itself can insure in the event that the family and individual themselves prove unable to satisfy these needs. Elsewhere it has been shown that under modern conditions of industry, especially in large centers, the family and industry are proving less and less able to insure either adequate vocational guidance or, more important, sufficient vocational training, to constitute for given individuals what might reasonably be called a fair start in life.

The welfare of the individual must be considered from the following standpoints: a young person born into society represents, economically speaking, a liability during his first fourteen to twenty-two years according to the prevailing standard of living and the calling for which he is to be fitted. Thenceforward, as long as properly employed, the individual produces a surplus of economic goods until illness or the decrepitude of age begins, when his productive capacity declines, finally reaching the zero point and thereafter, economically speaking again, the individual becomes a liability to society. Collectively speaking, the individuals of society must, during their period of productivity, produce not only sufficient for their own maintenance, but a surplus sufficient to meet the needs of young and old dependents, the needs of non-producers in society who must be carried (delinquents, defectives, chronically ill, etc.), and also such an amount as may be necessary to add to the capital, both fixed and mobile, of society.

It is clear that through proper training in skill, related knowledge and vision, the individual enhances his productive capacity. Reference must again be had to the fact that the total productivity of the individual is dependent upon many other factors besides his individual skill or possession of technical knowledge, such as the current state of inventions, the presence of natural resources, the presence of initiating powers, the type of prevailing organization in industry, etc. Of these, of course, the skill and technical knowledge of the individual are the elements that are most completely within his own control. The others, to a large extent, are a part of the natural or social inheritance with reference to which the individual is in a considerable degree helpless.

Under modern conditions of production involving large amounts of technical knowledge and organization of industry, we can assume that the proportion of unskilled labor that can be used, or of those who can bring to work only physical strength, is diminishing rather than increasing. Some of the factors here involved are confessedly obscure and until the supply of technically qualified labor in any given field is demonstrably larger than the demand, we shall have to take the position that the training of those who would otherwise be unskilled becomes permanently a source of increased productiveness.

2. Apart from increase of economic productiveness the vocational education of the individual may be considered also in reference to his welfare as contributing materials to his joy in work, conservation of health and strength, opening opportunities for leadership, making for thrift and savings, lessening the deadening effects of routine work and giving certain important cultural derivatives from the work itself. All of these may be regarded as important and necessary factors in the well-being of the individual and probably to be achieved most effectively through a broad and rightly directed vocational education.

3. Granted social provision of ample opportunities for vocational education, it may be assumed that from seventy to ninety per cent of all persons will in due season take reasonable advantage of such opportunities. It would certainly be sound policy to force the remainder, even if at a belated period, to come under a régime of compulsory attendance and obligatory learning of a vocation, much as we now require youthful prisoners in juvenile reform schools and reformatories to "learn a trade," where it is evident that other agencies do not make provision for such education.

V

The Junior High School is undoubtedly rapidly evolving and being approved as a new type of school in American education. Its probable relation to vocational education is not yet clearly defined. It seems expedient therefore to analyze some of its salient features in detail.

Proposals for the junior high school type of school organization are chiefly, as yet, proposals for administrative readjustments. We hear, as yet, very little regarding probable pedagogical changes — in courses of instruction and methods of teaching as now desired or expected in the upper grades. In large measure the new type of organization is sought simply as a means — in the minds of many persons an indispensable means — of attaining the educational goals which, long ago, we set ourselves for children in upper grades, and in some cases for all children over twelve years of age.

1. The existing type of organization as found in almost any urban community in the United States is usually as follows:

(*a*) The elementary school consists of eight or nine grades, children in which, ranging from five to about fifteen years, are all housed in one school building;

(*b*) From one fifth to one third of the pupils twelve years of age and upward are found retarded in grades below the seventh, competing with younger and, as a rule, brighter children.

(*c*) The grade teachers teach all subjects in grades below the seventh; and in the seventh and eighth, all but manual training for boys and household arts for girls and, occasionally, music and drawing, which are taught departmentally; while in perhaps three to five per cent, only, of all schools are fairly comprehensive systems of departmental teaching found.

(*d*) The upper grade teachers are women, with increasingly rare exceptions; these women have not had special training for upper grade work, but are, as a rule, the abler of the teachers, who obtained their first experience in country schools or lower grades (upper grade positions frequently carry better salaries, and are therefore sought by women who expect to remain permanently in teaching).

(*e*) The course of study is uniform for all pupils alike, except for the differentiation of manual training for boys, and household arts for girls; its primary elements being: English language, English literature, geography, American history, and arithmetic; while hygiene, science, drawing, music, manual arts, civics, etc., are secondary or incidental elements, foreign language and vocational guidance being rare elements.

(*f*) Standards of graduation are determined almost wholly by the prevailing standards of admission to high school; hence, as a rule, less than fifty per cent of all pupils required to attend school obtain the elementary diploma.

2. The school organization which is urged as being more effective — namely, the junior high school — should have the following features:

(*a*) All children from five to twelve (except children under twelve who have finished the sixth grade) should be

taught in schools located near their homes (schools which in cities need not exceed four or five rooms in size), staffed by women teachers only.

(*b*) These lower elementary schools should never be very large — ten or twelve rooms would be a desirable maximum — and the principal should be simply a head teacher; but for each fifty to seventy teachers in these schools in any community there should be a woman supervisor of instruction.

(*c*) All children between twelve and fifteen years of age (including children under twelve ready for the seventh grade, and excluding children under fifteen ready for the regular or senior high school) should be sent to the central junior high school or intermediate school (it should be assumed that a walk of one and one half, or even two, miles is not excessive for this purpose).

(*d*) Promotion should, as far as practicable, be by subject so that a retarded pupil, for example, in the fourth grade in arithmetic may, if qualified, enter seventh grade geography; and a boy backward in history may nevertheless take eighth grade industrial arts (manual training) if qualified.

(*e*) The course of study in the central school should offer the pupils a large range of elective or optional studies in addition to certain essentials in English language, English literature, American history, community civics, and geography which should be prescribed for all (for retarded pupils special classes in these subjects to be formed).

(*f*) Teaching in the junior high school is expected to be departmentally organized by subjects, or, preferably, along lines of the Gary plan, by groups of related subjects; and it is expected that this organization will produce a demand for specially qualified teachers.

(*g*) If the state is willing to pay the price, a certain proportion of men teachers should be assigned to departmental positions, not primarily because they are necessarily better

teachers than women, but because it is desirable to introduce, in boys' classes at any rate, the influence of masculine personality.

Those of us who favor such reorganization of education as will give us the six-three-three plan or the six-two-four plan — with the junior and senior high schools either as two and four year or three and three year schools respectively, and in any event as large central schools — do so because we believe that, on the whole, the psychological conditions of children as well as their social needs justify such reorganization, even if it cost the community slightly more financially. What are those conditions, and what are these needs?

1. The conditions are summed up in the two words "increasing variability." Uniform programs of education, uniform teaching methods, and non-specialized teachers presuppose groups of people of substantially uniform characteristics. But all recent inquiries tend to bring into relief facts as to the increasing unlikeness of children beyond twelve years of age. We recognize them as differing moderately as regards height, weight, and bodily strength; materially as regards abilities in such studies as literature, vernacular language, and history; and very greatly indeed as regards abilities and interests in music, plastic and graphic art, abstract mathematics, foreign language, and manual constructive work.

We should not, of course, fall into the foolish error sometimes made in educational writings, of supposing that these differences are greater (whatever that may mean) than are the resemblances or likenesses in the case of any two children. Two children of twelve may differ in height by as much as fifteen inches, but almost never do they differ by twenty-five per cent of the height of the shorter. No two children differ as much in respect to ability to learn a foreign language as either one does from a horse or other

animal as respects such learning. In the absolute sense, therefore, it may be repeated, the facts of resemblance among young human beings (as regards the elements that make groups of them relatively homogeneous) are vastly more numerous and significant than are the facts of unlikeness. But as regards the facts of likeness and unlikeness that are important to education, to the ends and purposes for which schools exist, all evidence points to the desirability and essential humaneness of all arrangements, which permit, in processes of instruction and training, recognition of deep-seated differences of ability, taste, and general educability.

Let us now make two general propositions as to which there will be no serious debate.

(*a*) If, possessed of endless resources and hampered by no restrictions of any kind, we were making educational programs for our children, we would doubtless, in light of what we now know regarding the unlikeness of individuals among them, make the programs for no two of them exactly alike in all respects. We would pay tribute to obvious differences as regards the gifts bestowed by the gods of heredity and early environment; and we would not ignore the probable opportunities and limitations decreed by fortune in the child's future life. We would strengthen some of his already strong powers; and where he was weak we might justly forego to strive for the powers for the foundation of which nature has done so little.

(*b*) On the other hand, except in rare cases of genius or defect, it is not practicable to educate children on the basis of strictly individual qualifications. In education, as in war, industry, transportation, worship, housing, and entertainment, economy and general efficiency require that we deal with people in squads, platoons, and divisions. We must have companies and regiments for fighting; congregations for worship; gangs, crews, and departments in industry; audiences and parties for entertainment; passen-

ger groups and classes for transportation; and grades and classes in schools. To talk of individual instruction, except as that is practicable within group organization, is to talk nonsense, except where the few children of wealth and rank are concerned. We can, of course, strive to produce the maximum of individual thought, initiative, and action on the part of the learner in the class, just as we can on the part of the unit in the squad, crew, congregation, audience, or passenger group. But it is clear that individuality of action in these groups must, while the ends of group action or reception are to be met, be greatly subordinated to the requirements of subjection to orders and enforced limitations, uniformity of stimuli, and conformity in behavior.

In the organization of groups for school education, therefore, we cannot, though we would, provide special programs for each individual (as men and women did for Helen Keller). We must provide for a certain amount of regimentation, classification, grouping. But these groupings must not be fixed in rigid groups. We must not allow the school to become a Procrustean bedstead to an extent greater than is absolutely necessary and inevitable. We have had the school compared to a saw mill, cutting its "stock" into standardized lengths. Schools have done this in the past. Like armies, churches, and transportation, schools have at times made the organization of groups an end rather than a means, forgetting that the units with which they deal are in considerable measure unlike.

2. Besides the psychological "conditions" of the individuals composing our school classes, what are their social "needs" that justify the proposed reorganizations of upper grade work? The keynote to these needs will be found in the words "progressively increasing differentiation." Modern civilized life is like modern industry or modern army organization. Functions are being increasingly differentiated, and activities and interests specialized according to all kinds of capacities and opportunities.

But it should be clear at the outset that as regards fitting individuals for group life the school has two different functions, which are at times in conflict. The groups into which children must fit are of various kinds. There are large groups and small groups — as (*a*) the nation, the religious denomination, the political party, the potential army of defense, the readers of good books, the economic organization; and, opposed to these, (*b*) the local community, the particular church or sect, the political gang, the squad or mess, the partisans of a particular book or writer, the embattled employees of a particular industrial establishment. There are vocational, as against cultural, groups — farmers, machinists, bankers, teachers, waitresses, homemakers, and defenders, as against patrons of art, readers of classic literature, subscribers to specified magazines, visitors to the "movies," illiterates, etc. Various other groupings may be distinguished — such as family groups, racial groups, sociability groups, economic coöperative groups, worshiping groups, etc.

Now it is one of the functions of education to predispose and fit its pupils for assimilation with the larger, as against the smaller, groups, in the interest of a wholesome social order, harmony, and economy of effort. We, therefore, seek that all American children shall speak a common tongue, write a mutually understandable prose, have a common knowledge of certain standard literature, comprehend and appreciate alike the important facts of our geography, history, and civic life.

But it is another function of education to see that our young people are fitted efficiently to discharge their responsibilities in the small groups of which they will inevitably be a part. Membership in, and sympathy with, the large groups of civilized society are essential to the harmony of the social order; but active and properly coördinated participation in the activities of smaller groups is essential to

efficient personal growth, individual efficiency, and ultimate usefulness.

Hence the desirability of partial group differentiation of pupils even as early as twelve years of age. Their needs include fitting for those special group activities in which they can most profitably serve themselves and society. As to some of these children it is certain that their opportunities for school education will close forever at or near fourteen years of age. We may not always know the particular individuals of whom this is true — although a shrewd social diagnostician, knowing the facts as to the home conditions, school standing in studies, intellectual interests, general moral behavior, and physical conditions of one hundred children at twelve years of age, could, I think, guess right as to ninety per cent of them. But even if we do not know the future as regards particular individuals, we do know it in large measure of collected groups, in the statistical sense — we know of probable numerical ratios and percentages; hence any refusal on our part to provide opportunities into which individuals will fit as well as may be on the initiative of themselves or their parents, with perhaps our advice, is wasteful, inefficient, and essentially undemocratic.

There is a certain small percentage of our pupils who, by virtue of their probable future opportunities for usefulness and self-gratification, ought to have early opportunity to study a foreign language — German, French, Portuguese, Russian, or Japanese. Here again, at the age of twelve we may not be able to select just the persons who should be advised to do this; but if the opportunities are provided, and if parents are fully advised as to the conditions, requirements, and probable fruits of this work, and if admission to it is restricted to those who have shown superior ability in the vernacular, choices will be right perhaps fifty or seventy per cent of the time.

It is assumed here, of course, that no vocational training as such will be given in the junior high school. That will come later and will naturally require a large degree of specialization — in a city the establishment of even hundreds of different and unlike specific vocational schools to prepare for the hundreds of separate commercial, industrial and domestic occupations into which modern life is divided.

But in the junior high school large opportunities should be given for practical arts training, which, while not vocational in its outcome, may help towards vocation-finding, and will certainly give insight into the ideals and social significance of occupational life, if properly directed.

To be of real service, however, practical arts education (industrial arts, agricultural arts, household arts, nautical arts, and commercial arts are all included under this head) must be diversified according to the fundamental interests of children; and the spirit in which each type of work is to be approached should be that of the amateur. Courses should be flexible. A pupil entering printing for the first time, for example, should have the option of several simple introductory projects; after he has given reasonable attention to any one he should, if he wishes, be permitted to take up projects in a totally unrelated field — *e.g.* gardening.

Hence the need of the flexible course of study which only the junior high school type of organization can provide.

Let us repeat: The proposed junior high school type of school organization is an administrative means — a necessary means — to certain essential forms of improvement of the education of young people from twelve to fifteen years of age.

Principles of Aim. — The following are submitted in conclusion as essential principles governing the organization of curricula of the junior high school:

1. Junior high schools are to be considered as of two types:

Type A, replacing present seventh and eighth grades (the 6–2–4 plan), to offer normally two years of instruction (with occasional provision for a "graduate" year paralleling, but not replacing, the first year of the regular high school). Modal ages of pupils expected, seventh grade 13 years, eighth grade 14 years.

Type B, replacing present seventh and eighth grades and first year of high school, to offer, usually, three years' work (the 6–3–3 plan). Modal expected ages by grades, 13, 14, and 15.

For purposes of convenience it is assumed that full-time attendance of all children to the 14th birthday is enforced, after which attendance (except for much retarded pupils, and except, in some states, continuation school attendance) becomes voluntary.

2. There is no suggestion in American school legislation, and almost none in educational theory generally accepted in this country, that any kind of *training* that might properly be called vocational should be required or even offered within that period of the child's life, during which general school attendance is obligatory. This is certainly sound policy. Hence the A type of junior high school, at least, must be expected to devote itself almost, if not quite, exclusively to giving what, as opposed to vocational training, should be called *general* or *liberal* education — that is, general education towards good citizenship, towards personal culture, and towards physical fitness, as the numerous specific powers and qualities under these heads are approved among our people, irrespective of the particular vocations they follow. But *amateur* participation in the simple phases of occupations which the pupils do not expect to follow — printing, gardening, typewriting, bicycle repairing, house painting, as well as observation of, and much reading about, the occupations which men and women actually follow, are to be regarded as valuable elements in liberal education.

These socializing phases of liberal education which lead to widened and deepened vision, rich experience, enlarged sympathies, and genuine humanism should be greatly extended in the junior high school. All of these approaches to new experience and enrichments of old experience will in a measure, too, serve the purposes of vocational guidance. Hence all general vocational guidance (and, under some circumstances, even the specific individual diagnosis and recommendation that should immediately precede placement in vocational school or vocational employment) is to be regarded a legitimate part of the general or non-vocational education appropriate to the junior high school.

3. Practical arts courses, involving maximum practicable amateur participation for general education, will surely be offered to a greater or less extent in prosperous and progressive junior high schools, than in grades and high schools in the past. If the public approves the idea of the "longer school day" we may expect to see as much as two hours daily available for practical arts participation. But, obviously, there are so many varieties of practical arts courses, long or short, to be drawn upon, that great flexibility of offerings and large freedom of election by the pupil will be desirable wherever administrative necessities and economics do not render it impracticable.

4. What can or should be the vocational contribution of the type B junior high school? Obviously, the majority of the pupils in the third grade or year of this school will still be interested in obtaining a general education, in most cases to be continued in senior high school or college. But some will have the desire, or be under the necessity, of entering early upon productive work. What can be done in or by the B type of junior high school in its third (or even a fourth graduate year) to prepare these for their vocations?

An adequate answer to this requires analyses, on the one hand, of possible vocations, and, on the other, of suitable

procedures preparatory thereto, which analyses educators of academic prepossessions have been loath to make. What are the actual vocations for which, in specified communities, youngsters of from fourteen to sixteen years of age can be trained (or otherwise prepared) in whole or in part? Can the "junior high school," conceived chiefly as a faculty and curricula, effectively include such preparation in its work?

Only definite surveys in each case, taking account of local conditions, can give final answers to these questions. But there are a few principles that seem now possible of definition.

Probably, outside of agriculture, there are very few "trades," systematic training for which can profitably be begun as early as fourteen or even fifteen. For homemaking, motives are probably not ripe — and certainly vocational training is wasted on those who have no keen, vital motive for it. The manual or craft trades — dressmaking, machinist work, cooperage, blacksmithing, hand tailoring — are steadily disappearing, except in the case of the few in building trades and personal service — house carpentry, plumbing repair, barbering, waiting on table, shoe repairing, and horseshoeing. But in commercial and industrial fields, subdivision of labor and specialization of process have done much to make available to young people at almost any age specialized callings which, for juvenile workers — and for them only — pay well. Proper provision of opportunities for vocational training for juvenile workers at the close of the periods normally devoted to juvenile employment — for doffer boys, *e.g.* at seventeen or eighteen, for factory girls, perhaps just before marriage — has yet to be made by society. But it is certain that for the usual juvenile occupations, very brief courses of thoroughly practical training will suffice. One month of intensive training for the doffer boy, three months for the messenger boy, six months for the

salesgirl, and eight months for the power operator would doubtless suffice.

Can the junior high school effectively offer such training? Experience seems to answer in the negative. Probably it will require the evolution of the " vestibule " school.

CHAPTER XI

THE TRAINING OF TEACHERS FOR VOCATIONAL SCHOOLS

Dearth of Vocational Teachers. — During the last few years educational administrators, called upon to provide various types of vocational schools, have been compelled to make bricks without straw. Naturally teachers have been unavailable. Men technically equipped in various agricultural branches were to be had; specialists in bookkeeping and stenography could be found in business; and skilled trade workers could be had from the crafts and factories at salaries a trifle above those paid to high school teachers. But these men were not teachers; and only rarely were they equipped to cope with teaching in fields where traditions are few and each man is expected to hew out the paths of method for himself.

From the manual training field came a few men who had become, through their own efforts, real teachers of carpentry, machine shop metal working, printing and electrical installation. Household arts or home economics teachers have striven valiantly to answer the call for teachers of vocational homemaking; but since the essential characteristics of training for this vocation (or these vocations) is still somewhat obscure, it is impossible as yet to predict results.

Until the passage of the Smith-Hughes Act, very little effective provision had been made by the states for the training of vocational school teachers. A few commercial, and many agricultural and home economics, school graduates had been prepared to teach *technical* subjects in their re-

spective fields; but there were few who could teach *business practice* in any of its aspects, or *farming* or *homemaking*. A few evening classes designed to prepare selected trade workers to teach their specialties had been established. But all of these sources have been understood to be provisional, and unsatisfactory at best.

The pressure of war training for the shipbuilding and other industries forced the development of some valuable "short course" training of men, already skilled as industrial workers, to become teachers of *practice* in industrial specialties. The lessons of this training still await application.

During the next decade it is certain that a large amount of study will be given to the training of vocational school teachers. The conditions and problems analyzed below will certainly require a large amount of investigation.

Types of Vocational School Teaching. — The simplest types of teaching in vocational education are, of course, to be found when the elder worker or the more skilled worker shows the younger or less skilled. At bottom, doubtless, there exist in all persons genuine instincts of teaching — otherwise to be described as instincts of showing, leading, helping, suggesting, instigating, directing, controlling, governing, organizing, commanding, etc. Likewise, under the right social stimulus, there probably always appear in normal individuals the "learning" instincts — instincts of following, imitating, yielding, inquiring, submitting to authority, desire to be shown, etc. The operation of these social instincts can be seen on any playground, in any school, shop, or other theater of social activity.

On the other hand, the most complicated types of vocational teaching are to be found in large schools of vocational training where teaching functions are highly subdivided, — where, for example, one teacher, who, perhaps, has never practiced the vocation itself, imparts certain technical knowl-

edge, another directs certain experimental work, and still a third supervises initial efforts at practice. Subdivision of vocational teaching of this character can now be seen in normal schools, agricultural colleges, medical colleges, schools of navigation, and the like. In not a few commercial departments of high schools, one teacher takes charge of stenography, another typewriting, a third of commercial law, a fourth of English. A few of the larger trade schools exhibit similar tendencies.

An intermediate stage is found where one teacher or type of teacher is responsible for "practice" and another for so-called "theory" or the "related technical subjects." In a few cases of half-developed or self-styled vocational schools, a teacher of "manual exercises" has been found, who is not himself a master of the trade being taught, but who undertakes to teach on the basis of exercises, some of the special activities supposed to be involved in the trade. The cabinet-making, printing, woodturning and lathe work of some manual training high schools, the needlework of household arts schools, the "business practice" of the commercial schools, and the school gardening of agricultural schools are examples.

There are good grounds for believing that an ideal vocational education, at least for the non-professional occupations, can best be given by one person who is at once master of its practical phases, and at the same time intimately acquainted with its technical aspects, and who, with these powers combines a large vision as to the possibilities of the right exercise of the calling to affect for the better society and the personality of the worker. A worker with this equipment who is also a gifted teacher would probably advance beginners, at least in vocational competency, faster than could any other type of teacher. Some successful experiments in agricultural education have been executed on this basis (based upon the "home projects," the pupils giv-

ing something over half their time to these home projects, supervised by the teacher).

But there are few indications that this method of vocational education will prove successful except in those two classes of callings which are in many respects yet in an elemental or primitive stage of evolution, — namely, farming and homemaking. The same method should be capable of application in many monotechnic industrial occupations (specialized machine processes or subdivisions of trades), but teachers equal to the responsibilities of such work are as yet hardly available.

It is highly probable that in most forms of vocational education, teaching processes will become increasingly specialized, and that even others than teachers will be required for special phases — business agents to take charge of the administration of work, "coördinators" to arrange for and supervise, on behalf of the school, pupils assigned to part-time productive work in shops, etc. Probable developments in this direction can best be considered by taking the different classes of vocations successively.

Teachers in Professional Schools. — Professional schools now usually procure their teachers in one of two ways: (*a*) successful practitioners in the profession itself are detached to become teachers, either on a part or whole time basis; or (*b*) promising graduates, even with no practical experience, are given assistantships and are then slowly elevated to higher rank, the requirement often being imposed that some special study or research, and perhaps travel abroad, shall parallel the earlier years of service.

Normal schools now usually procure their teachers under method (*a*). Formerly, when medical and legal education in college consisted chiefly of lectures, these lectures were usually given by well known practitioners. On the other hand, agricultural and engineering colleges, and those schools of law and medicine which are integrally related to

university organizations and which tend to become more complete as respects the offerings of their various departments, usually recruit their teaching forces under method (*b*). In these cases, however, there is always a considerable amount of pressure to draw into the teaching staff successful practitioners from the field. There are some indications that this practice will increase in the future, although the lack of teaching ability shown by practitioners constitutes a common obstacle.

Normal schools, while still making little provision for the training of their own teachers through having novices begin in assistantships, are increasingly disposed to insist on a period of graduate or advanced professional study as a preliminary to the acceptance of a normal school teaching position on the part of candidates otherwise of acceptable maturity and concrete experience.

Agricultural School Teachers. — There are, as yet, in the United States few agricultural schools (as distinct from agricultural colleges) which offer what is even remotely and partially a vocational education for the various vocations comprehended under the collective terms of gardener, farmer, and stock raiser; hence the problems of training teachers for these schools have not really come to the front as yet. Until the essential pedagogy and administrative principles which shall characterize effective vocational agricultural education have been formulated and generally accepted, we shall have to content ourselves largely with speculation.

Nevertheless, some things are now clear. If boys of from fifteen to eighteen years of age are to be trained to be successful gardeners, farmers, and stock raisers (or, more pretentiously, horticulturists, agriculturists, breeders, dairymen, etc.), a large amount of definitely organized practical experience must be made an essential part, and probably a major part, of this training. Experience tends to show that

this generalization holds, even in the case of those boys who have lived, and, in out-of-school season, worked, on farms.

Clearly then, the teachers of practical agriculture to these boys must themselves be capable of doing successfully those forms of farming which they undertake to teach. Clearly also, they must have a good background of technical (or "related science") knowledge of agriculture. In other words, the man who is to direct the practice of any phase of agriculture by vocational school pupils must possess the equivalents of three sets of qualifications: (*a*) he must be an experienced farmer or at least demonstrably capable of being a successful farmer; (*b*) he must have a technical or scientific knowledge of agriculture (at least in his special field), ordinarily the equivalent of that required for a degree in agricultural college; and (*c*) he must have demonstrated some genuine teaching ability.

It is undoubtedly the obligation and opportunity of the agricultural colleges of the United States, in view of their large responsibility to state and nation, seriously to undertake the task of training teachers for agricultural schools who will meet these requirements. Probably, however, two antagonistic conditions will have to be overcome before they will do this effectively. In the first place, as indicated above, the actual requirements of successful vocational education for the agricultural vocations must be defined, formulated, and made a matter of demonstration. In the second place, the authorities in charge of agricultural colleges and the other related agencies of scientific agriculture must become convinced that there is a place, and a large place, for vocational education in agriculture below the level of the college. In the main, they are not now genuinely convinced of this and so remain indifferent, if not in some cases secretly hostile, to proposals for the effective training of teachers for such schools.

The problem will probably be simplified when American

secondary education in its administration shall have taken that large step — almost leap — which is necessary to place secondary school teaching on a professional basis; namely, of refusing to accept a bachelor's degree, even when it has been obtained partly on the basis of so-called educational courses, as indicating the equivalent of professional preparation for teaching. The country ought to be quite ready to stand for a legally imposed requirement that at least one year of definite professional preparation additional to the requirements of the bachelor's degree shall be met on the part of all secondary school teachers, as is now required in one state, and provided by a few colleges.

Once this requirement is established, the agricultural colleges will find in this graduate professional year at least an opportunity, if not an incentive, to give professional preparation to prospective agricultural school teachers, especially those who are to undertake the teaching of practical agriculture. These agricultural colleges, though offering ostensibly vocational education, are still tied to the chariot wheels of the B.S. degree which can in no true sense be a professional degree, and which must always seriously deflect the aims of professional education.

Doubtless education for the agricultural vocations will be so specialized in large schools as to permit of a moderate proportion of places for technically equipped specialists who may nevertheless have only a bowing acquaintance with the practice of agriculture. But in general, it is to be expected that eventually all persons teaching agriculture towards vocational ends will have had some experience in the practice of that calling.

It is probable that the study of general agriculture, or special phases, such as home-gardening, practical nature study, etc., will have a growing place in schemes of general or liberal education, especially for children from ten to sixteen years of age. Work of this character will not be

regarded as vocational, and will not require teachers having practical knowledge of agriculture.

Commercial School Teachers. — Few agencies now exist which have as their object the training of commercial school teachers. Commercial schools and departments have only rarely defined their objectives at all in terms of vocational efficiency, hence they have not created a demand for teachers demonstrably able to meet the practical requirements of a commercial vocation. They make use of several kinds of specialists — one who "knows" a system of stenography, one who can teach typewriting, and others who can teach the academic subjects such as commercial geography, English, law, and mathematics (these rarely deserve to be called the "related technical" subjects, in view of the "academic" methods employed in teaching them).

Usually the teachers of the technical subjects, — typewriting, stenography, bookkeeping, business methods, etc. — are taken from approved graduates of public or private commercial schools. In not a few instances, persons with training for, and, possibly, experience in, regular school positions take some commercial work and thus qualify as teachers of commercial subjects.

Many universities are now establishing business or commercial departments, but there is no evidence that these will seriously undertake the training of teachers for commercial schools.

Some years ago, the Massachusetts State Normal School at Salem established a special department for the training of commercial teachers. At first the course was two years in length; in 1912, it was lengthened to three years; and in 1914, a fourth year was added, to be given exclusively to field work as described below.

In general, the Salem department does not train specialist teachers within the field of commercial teaching, — that is, teachers of stenography as distinct from teachers of book-

keeping, and other specialties. Theoretically, each graduate is expected to be able to teach any and all commercial subjects that might be required in the business department of a small high school. Necessarily, the equipment of these graduates cannot be very complete at any point, especially as they must have taken small portions of numerous studies, technical and pedagogical. Necessarily too, they are quite lacking in the vocational viewpoint or the capacity to trace the results of the subjects they teach in their practical functioning. To them, "bookkeeping" is chiefly a set of "principles," not an extremely variable form of practical achievement in the world of business affairs. Hence the subject as taught actually functions in practice only as the study of trigonometry as taught in school or college functions in civil engineering. Typewriting and stenography are learned more as specific arts, but even here it is difficult to approximate the requirements of the business world.

Many of the graduates of the Salem school have attained success as teachers in high schools having commercial departments, notwithstanding the comparatively general and necessarily incomplete character of the training they have received. This success has in part been due to the fact that the high school departments in which they have been employed have been, in reality, only quasi-vocational. In many cases the principals of these schools have been more concerned to make their so-called commercial departments serviceable means of general education (sometimes for an inferior class of students), than to insure their functioning as agencies of definite vocational training for commercial occupations presenting known requirements.

In 1914, the Board of Education added a fourth year to the Salem training course; but without increasing the actual amount of school work required. It was planned that each student, after two years' attendance in the training school, should obtain wage-earning employment in offices

or stores for the third year, and return to complete the course in the fourth year. It was desired that the year of wage-earning employment should, as far as practicable, be divided in equal parts among the following four commercial occupations: salesmanship; bookkeeping; general office work (clerical); and stenography and typewriting. In practice, of course, this ideal scheme, owing to the exigencies of obtaining employment, could not always be carried fully into execution.

Nevertheless, even under most unfavorable conditions, there is every reason to expect that the year of practical work required will give the prospective commercial teacher a valuable body of experience with some of the concrete realities of the commercial occupations, as a result of which she will surely teach with greater vocational purposiveness.

There are, as yet, almost no institutions undertaking to place the training of teachers for the vocational commercial education of its various possible kinds on a higher basis in the United States. No very strong demands seem as yet to exist for such an institution; possibly such demands will not be made until the true character of vocational education shall have been more adequately defined than at present. In large part, commercial education in America seems to be in a state of arrested development, halting at a kind of midway technical stage between "general" and "integral" or basic vocational education.

Industrial School Teachers. — The training of teachers for industrial schools presents many novel problems. In the first place, there are in existence no institutions seriously undertaking such training at present. In the second place, the industrial occupations have become indefinitely subdivided until, in any large community, they literally number many hundreds. In the third place, many of the recently developed industrial trades or specialties or specialized jobs, as they may be called, seem on the surface to demand no

special training in their workers. Nevertheless, it is now clearly apparent that for the sake of the workers themselves as well as for the sake of the industries and the economic prosperity of the country dependent upon them, industrial education of many types must soon be developed under public auspices. It is highly probable that within a short time the Smith-Hughes Act with its national grants will act as a gigantic stimulus to the promotion of industrial education in all industrial states.

For the purposes of discussion here, every industrial specialty for which wages is paid will be called a trade, no matter how far its subdivision may have been carried. Furthermore, the three fundamental aspects of vocational training; namely, (*a*) that having to do with the attainment of practical skill, (*b*) that having to do with acquiring related technical knowledge, and (*c*) that having to do with acquiring general knowledge related to the vocation, will be here respectively called (*a*) trade practice, (*b*) trade technology, and (*c*) trade sociology.

In a complete program of industrial education for any one occupation, there would be included under (*a*) (trade practice) all that training based on practice in productive work, such training to involve rigid tests of capacity to produce quantity of output as well as quality of output, as a final condition of approval.

Under (*b*) (trade technology) will be included all that systematic instruction in related sciences, arts, mathematics, and special technique and "tricks of the trade," which go to make up technical proficiency.

Under (*c*) (trade sociology) will be included all that instruction in the history of the occupation, its economic and social significance in the world at the present time, the legal rights and obligations of its workers, principles of sanitation and hygiene as applied in the industry, and many other facts of a sociological nature.

A fundamental assumption regarding industrial education for trade pursuits which may differentiate that education in greater or less degree from other forms of vocational education is to the effect that trade technology and trade sociology cannot advantageously be taught in advance of trade practice. In the professions, and, doubtfully, in agriculture, homemaking, and some commercial fields, it seems to be possible in a degree to teach occupational technology and occupational sociology to some advantage in advance of the teaching of the earlier stages of occupational practice. All experience is convincing on the point that this is not practicable or desirable in industrial education.

Furthermore, it is probable that in the majority of cases, trade technology and trade sociology cannot advantageously be taught at a considerable interval subsequent to the acquisition of the results of trade practice. Hence, the general assumption that effective industrial education involves the adoption of means whereby trade practice, trade technology, and trade sociology shall be taught in some manner that is substantially *pari passu,* or in intimate correlation. Probably, some means whereby the acquisition of a moderate amount of the skill resulting from trade practice shall be followed by a substantially equal period devoted to building on this basis related trade technology and trade sociology will prove most effective.

The first assumption to be made relative to the training of teachers for industrial schools is that no one can be a successful teacher of trade practice who is not himself capable of entering the trade itself as a fully equipped journeyman. Furthermore, it is assumed that no one can be a successful teacher of trade technology who has not had substantial experience, although not necessarily the amount required of a journeyman, in the practice of the trade itself. Finally, it is assumed that the only safe teacher of the trade sociology appropriate to any particular industrial calling is

one who in a variety of ways has had some actual experience in that calling itself. The further assumption may safely be made that a teacher of trade practice will not ordinarily need to have the equivalent of a general high school education, although, of course, the possession of such a general education would be of undoubted advantage to him. The following may then be regarded as some of the distinctive problems involved in the training of industrial school teachers. (1) From what sources shall the student body be derived? (2) How shall trade practice training be provided? (3) How shall training in trade technology and trade sociology be provided? (4) How shall training in methods of teaching and school administration be provided? (5) How shall students be supported during their training? (6) What teaching force must be provided?

1. At present, persons seeking to teach in industrial schools are taken chiefly from the trades themselves, and are given by one means or another a meager training in trade technology, trade sociology, and methods of training. Another small source of supply has been the manual training school from which a few men of practical capacity have been recruited. These methods of securing industrial school teachers are precarious for a number of reasons, which do not require discussion here.

Provided sufficient facilities for a complete training could be made available, undoubtedly the first sources of students for prospective teachers could be found by taking young men and women who possessed the equivalent of a good elementary education, and perhaps of a two years' high school education, and subjecting them to such training that after a period of from four to six years, they would have acquired the equivalent of the practical skill of journeymen in their respective occupations and would also in the meantime have acquired considerable proficiency in methods of teaching and other necessary subjects. In time, it might be expected

that trade or industrial schools would supply some excellent material for training schools of this character.

2. Assuming the existence of a body of young students not yet having had experience in trades, but who are desirous of becoming trade teachers, how shall they be given practical experience substantially equivalent to that expected of the journeyman in the trade? The maintenance by a training institution of productive shops sufficient for this purpose would be difficult and expensive, and it would be especially hard to insure that these shops would reproduce faithfully the conditions of production in the commercial world. Undoubtedly, best results would be secured by a coöperative working arrangement with industries whereby the novices could be assured of sufficient opportunity on a part-time basis to cover all the stages of apprenticeship in the industry under actual commercial conditions. It might prove advisable for the training institution to give a few months of introductory shop practice as a means of insuring that the novice who was seeking a place in the industries could come to his first wage-earning, or at any rate, responsible work, with some slight preparation. This scheme of training for any particular trade would probably involve special arrangements for part-time participation. Under some circumstances, the novice might give one week to productive work and an alternate week period to the study of his theoretical subjects in the training institution. Perhaps for many industries an arrangement involving alternate periods of one month, three months, or a half-year might prove more advantageous. In every case, the training institution should provide that for any particular job in the commercial world, a pair of students should be available so that continuity of service to the employer could be assured.

3 and 4. Training in trade technology and trade sociology, as well as in methods of teaching and other related pedagogical subjects, manifestly cannot be given in the in-

dustry itself. These subjects should be provided for by the training institution, in every case under the guidance of specialists in the trade itself. In the last stages of the training of the prospective teacher, some facilities for practice teaching, perhaps in the capacity of an assistant in existing vocational schools, should be made available.

5. There are special reasons why prospective industrial teachers should have the question of their support during the period of training carefully considered. As a rule, these teachers will come from the families of artisans and others who can hardly be expected to provide for their support during the prolonged period of training. After the first year of the course of training outlined above, it should prove easily possible for the learner to earn enough through his part-time participation in industry to meet his immediate necessary expenses. The lowest sum now usually paid to quite young part-time workers in trade work is 10 cts. an hour (all figures are based upon 1914 prices). For the more mature student under consideration here, this could undoubtedly be increased to 15 cts. or 20 cts. an hour in many trades, which, on the condition of half-time participation in wage-earning work, would suffice to meet, in large part, expenses for living, that is, from $180 to $240 per year.

6. Particular attention would be required in the matter of providing a suitable teaching force for a school of the character here contemplated. The training institution itself would necessarily have to contain a few specialists in trade technology, trade sociology, and methods of teaching. Quite probably, in time, one person could be found who could equip himself to give the trade technology and the trade sociology of from three to half a dozen distinct trades, especially those in related fields, such as the building trades or the textile trades or the transportation trades.

One of the most important officers of instruction would

have to be the person who would supervise the progress of students in their shopwork. This man corresponds to the coördinator now found under Dr. Schneider's arrangement in Cincinnati University. It is understood, of course, that the student working in a commercial establishment is under the immediate direction of the foreman, as is every other workman, and that at any given time the foreman and the learner are both concerned primarily with production. In the shifting of the worker from one job to another, however, the recommendation of the coördinator must play a large part, and it is to the coördinator that the student must look for an interpretation and analysis of his experience as well as for many suggestions looking to its improvement. In many cases, doubtless, the coördinator could give the trade technology and trade sociology required for a particular field of trade training.

The following are certain concrete proposals based upon the foregoing:

Let it be assumed that there have been established in various parts of the country, industrial schools for the training of plumbers. These schools are in search of teachers for whom the prevailing salary is from $1400 to $1800. An industrial normal college undertakes to train these workers. The following are the plans that might be followed:

Plan A. The industrial normal college advertises evening pedagogical courses for journeyman plumbers, these courses being designed to give so much pedagogy and also so much of the trade technology and the trade sociology of plumbing as may be necessary to provide proper equipment for teachers of plumbing. If the supply of properly qualified journeyman plumbers were sufficient for such a comparatively inexpensive means of training teachers, this plan might suffice to meet existing demands.

Plan B. The industrial normal college might advertise courses wherein young men possessing the equivalent of a

high school education could receive two or more years' training in the technology of plumbing, the sociology of that trade, and some training in methods of teaching. The graduate from these technical courses would then be expected to serve at least a two years' apprenticeship as a plumber, after which he would be approved as a teacher in an industrial school for plumbers.

Plan C. The college might advertise courses of from four to six years in length wherein young men of from sixteen to twenty years of age, possessing the equivalent of a two years' high school education, might be trained on a part-time basis (part time in industry and part time in school), to become teachers of plumbing. After the first half year, on the basis of present practice, it might be assumed that these young men as assistants in plumbing would be paid from 10 cts. to 20 cts. per hour, for the services, thus earning from $120 to $240 per year, on a half-time basis. The technical courses in the institution would be closely related to the practice being followed in the field. During the last years of a four or six years course, a part-time experience as assistant teacher in an industrial school could be substituted for participation in the industry itself.

CHAPTER XII

SPECIAL PROBLEMS OF VOCATIONAL EDUCATION

Vocational education in schools is of comparatively modern development especially in other than professional fields. Hence, administrators still encounter a large number of unsolved problems. Furthermore, all education is still in prescientific stages of development; and in proportion as efforts are made to reach scientific stages, new problems are revealed in the fields of liberal or general education, which also affect vocational education. The object of this section is chiefly to attempt to analyze and to give definite statement to some of these problems.

Every attempt looking to clearer analysis and definition of the problems of vocational education will hasten the day of experimental and other systematic attempts at their solution. This process of analysis and definition should be steadfastly opposed to the thinking in terms of "omnibus" generalizations that is so commonly characteristic of addresses and published articles dealing with the purposes and methods of vocational education. Definition, systematic organization or experience, experiment, measurement of results — these are some of the means by which education may be expected gradually to take its place among the departments of applied science.

In some instances these problems have been outlined in previous chapters, but they are restated briefly here for the sake of encouraging special study.

I. The Relation of General or Liberal, to Vocational Education

Problem 1. To what extent do studies designed for liberal education "function"[1] as to their content in various fields of vocational training?

For example, do Latin, ancient history, and algebra "function" at all in the training of the physician for his vocation? Do mechanical drawing and science "function" in the making of the bookkeeper? Do the studies of music and graphic art make any recognizable contribution toward the efficiency, on the vocational side, of the machinist, the farmer, or the cook? Are there cases where study of graphic art contributes to the productive powers of dressmakers — of high grade, average grade and low grade? Under what circumstances, if any, do mathematical studies contribute to the proficiency of farmers or carpenters? Or studies of chemistry and physics to homemaking?

Problem 2. To what extent and in what way do studies in general or liberal education so "function" in mental training as indirectly to make important contributions toward vocational efficiency?

For example, does the study of mathematics contribute specifically to the development of the mental powers, in kind or degree, requisite in the lawyer, the dentist, the music teacher, or the homemaker? Do the interests and types of appreciation developed in the study of literature "function" at all as valuable mental qualities in the training of the engineer, the house carpenter, or the clerk?

Problem 3. To what extent and under what conditions do various special types of vocational education so "function" as to result in the knowledge, appreciation, and ideals that are important in liberal education?

[1] The word "function" is used here in the sense that means and methods as adopted lead to results as intended. Studies, as well as methods of instruction, are means to ends; they "function" when the ends are realized as intended.

For example, in the case of a student who has studied little or no science, what will the vocational study of agriculture contribute as a by-product to his general insight into the applications of science? In what way will the study of teaching as a profession supplement deficiences in liberal education? Will an effective program of vocational training for the house painter contribute materially to his general intellectual and esthetic development?

Problem 4. To what extent and under what conditions will systematic vocational education contribute, as regards mental training, to the ends that are valuable in general education?

In what ways, for example, does the close application to practice and theory required in the training of a printer develop such so-called general intellectual powers as attention, concentration, order? Or how do the concentration and close thinking required on the part of a boy studying farming practically and theoretically result in the development of corresponding general mental powers? To what extent do the strong interests frequently evoked by vocational studies call into activity mental powers left inactive in general education?

Problem 5. To what extent is it expedient and desirable that the beginnings of systematic vocational education shall be postponed until after a definite degree of general or liberal education has been attained?

For example, if we assume that pupils are required to attend school until 14 years of age, is it expedient or desirable that from 12 to 14 a program consisting in part of vocational, and in part of liberal, education shall be made available? Is it practicable or desirable, in the case of youths from 14 to 16 who are to enter industrial callings at 16 years of age, to offer combined programs of liberal and vocational education prior to that age?

Problem 6. In case it seems desirable to divide the pupil's

time at any given stage between vocational and liberal education, how shall the division be made?

For example, shall studies be alternated by hours, as in an ordinary commercial high school; that is, one period, perhaps, being given to algebra, another to stenographic practice? Or shall the day be so divided that one half may be effectively given to concentration on vocational pursuits and the other half to general education? Or is a division on the basis of longer periods desirable; for example, one week being given to liberal education, another to vocational; or six months to liberal and six months to vocational education? Is a third program preferable, whereby the central part of each working day shall be given either to vocational or to liberal education, as the case may be, with the marginal part to the other type? For example, pupils might work from 8 to 3 o'clock on general studies (or vocational studies), and from 3 to 6 on vocational studies (or liberal studies). In practical life, it will be remembered, men usually pursue their vocations during the greater part of each working day, reserving evenings, holidays, etc., for recreational and cultural purposes.

II. Problems of So-called General Vocational Education

It is contended that certain studies or practices serve as a basis for general vocational education; that is, presumably, give fundamental elements needed in many callings.

Problem 1. To what extent are any of the studies usually found in a program of general education (excepting reading and writing) vocationally fundamental to a number of callings?

For example, it was formerly asserted that the study of Latin was vocationally fundamental to the subsequent study, for professional purposes, of law, medicine, theology, edu-

cation, and botany. It has long been thought that the study of mathematics is vocationally fundamental, not only to the engineering professions, but also to law, medicine, and almost all other advanced pursuits. It is a widespread belief that mechanical drawing is fundamental, in a vocational sense, to industrial, agricultural, and perhaps even commercial pursuits. Again, there survives a belief that a program of vocational education might be devised which would train the so-called handy or all-round practical worker.

Problem 2. Does modern society present a general demand for the person who, while not exceptionally proficient in any calling, is ready and practical in many; for example, the man "handy" with tools, the "all-round" clerk, etc.? Are there demands for ready men of this type in village or rural communities? In large factories? On shipboard? In regimental camps? In large buildings?

Problem 3. What courses of practical instruction will train the "handy" man, as he is in demand, for example, in farming communities? In which and how many of the following lines should he be reasonably adept — electric installation, tractor repair, well boring, animal surgery, house painting, concrete laying, horseshoeing, chimney building, water pipe laying?

III. Problems of the Transfer of Results of Vocational Education

Problem 1. To what extent and under what conditions do the results in skill, knowledge, appreciation, and ideals (or of practical experience in general) in one occupational field constitute an asset for entrance into another?

Problem 2. To what extent can the results in skill, knowledge, appreciation, and ideals (or of practical experience in general) obtained in one occupational field be utilized as a basis for systematic training toward another occupational field?

The following are examples of these problems: (1) To what extent does expertness in running constitute an asset in learning to swim? (2) To what extent can a thoroughgoing education in the practice of medicine be utilized when the doctor wishes to become a farmer? (3) How far can professional competency as a bookkeeper be regarded as an asset when the bookkeeper wishes to become a machinist? (4) If a man has been well trained as a machinist, to what extent can such training be drawn upon in equipping him to be a house carpenter? (5) A farmer's son "picks up" a great variety of vocational experience; to what extent does this constitute an asset when he wishes to become a physician, a locomotive engineer, a manager of an industrial enterprise?

(*a*) It is obvious that these problems are capable of being scientifically investigated as soon as psychology possesses the necessary tools. There exist now a large variety of popular beliefs or prejudices on the subject. For example:

(1) Some vocational school authorities believe that boys aged 16 or more, who wish to learn a trade, succeed much better if from 14 to 16 they have had a miscellaneous industrial experience as job workers in various unskilled or juvenile occupations. But effect of selection is obvious here, and is probably deceptive. Only boys of exceptional character, probably, seek admission to industrial schools after such a period of miscellaneous experience.

(2) There is a widespread belief that the varied and often intensive experience obtained in farm life constitutes a valuable basis for almost any kind of subsequent employment.

(3) It is also believed in some quarters that persons who have for several years habituated themselves to a special line of manufacturing or commercial employment (for example, bookkeeping, shoemaking, draftsmanship, weaving) are permanently disqualified in large measure from taking up employment in other fields.

(*b*) Even superficial analysis will show that these problems must be approached with reference to particular types of qualities involved. For example, few people would assert that skill obtained in playing baseball can be directly utilized in learning to swim. On the other hand, results of physical development, such as lung power, strength of arm muscles, etc., obtained in baseball may constitute valuable assets in learning to swim. Again, the life of the farmer's son may give little direct preparation in skill or knowledge for the work of a physician, but, on the other hand, a general attitude toward work, a disposition to finish jobs once undertaken, an appreciation of the value of money or recognition resulting from successful work, may in large measure be transferred.

(*c*) Much will depend, naturally, upon the relationship of the various occupations involved, according as these deal with similar working conditions, similar tools, identical materials, etc. One would expect a drill press operator to bring to the work of the planer a variety of important assets, while one would not expect the bookkeeper to bring to house carpentry at least similar assets.

(*d*) It must be recognized that prolonged practice in any occupation may, in an important degree, disqualify the person for pursuit of another not related to it. The man who has followed farming for several years is in many respects disqualified to become a counter salesman of dry goods; the actor disqualified to become a farmer; the machinist to become a bookkeeper, etc.

(*e*) The question is an important one for several reasons. In the first place, there are many occupations which cannot be entered upon in youth — for example, that of locomotive engineer. The locomotive engineer must have served in some other calling for several years, for which, presumably, he could have systematic training. Will his previous experience as stationary engineer or as fireman constitute, in

the long run, a sufficient preparation for his work as locomotive engineer? Again, systematic vocational education in schools for some occupations is easily possible; for others, extremely difficult. If a transfer can be easily effected, then we might train a person to be first a house carpenter or a farmer, even though we knew that eventually he would follow the sea as a sailor or work underground as a coal miner.

IV. The Problems of Professional Education

The problems of professional education are in the main remote from the purpose of this book. But one of general interest is that relating to the extent to which a program of professional training should base the so-called technical studies upon foundations of practical experience.

Problem 1. To what extent does effective vocational education for any profession require that the present order of studies, which involves the giving of technical instruction in advance of practical experience, should be modified, or even reversed in order that a certain amount of practical experience shall be taken perhaps at the outset and at intervals in the course of professional training?

For example, in the training of teachers it would be practicable, if desirable, to have a certain amount of practice teaching done at the very start as a basis for the subsequent study of methods, theory, etc. An engineering student might at the outset be given practical employment in something of an apprentice capacity along practical lines. A prospective physician might serve as a hospital orderly, nurse, etc., before completing his training.

Problem 2. To what extent shall training for professions which are not as yet clearly differentiated presuppose, as a basis, a complete professional training along the lines of professional training already established?

In agriculture, for example, professional fields of "ad-

ministration of agricultural plants," " rural engineer," " rural journalist," etc., seem to be in process of differentiation. In medicine, there is a demand for specialists in such fields as optometry, school physician, etc. In the commercial occupations, certain fields of expert inquiry, statistical work, and salesmanship seem to be assuming the proportions and standards of professions. In industry, we have as yet systematic training for the positions of foreman, overseer, and the like, only in very few fields.

(*a*) At present it is often assumed that before one may take up professional training in these undifferentiated or " nascent " professions, it is necessary that he should have a complete professional training along some established line. This process, however, is costly, and it is a question whether the resources of the community or of the individual trained are always equal to it. The question of necessity must also be considered. For example, the school nurse and school physician represent distinct demands to-day in specialized fields for which it is doubtful if the historic training of the nurse and of the physician are at all necessary prerequisites. The professions of rural engineer and of rural journalist may, on the other hand, be of such a nature as to require not so much a large amount of technical training in agriculture, as maturity and a wide range of experience before they are taken up.

(*b*) In many instances, indeed, the problem involved is one of maturity and experience rather than the purely technical training of the person embarking in such work. Most directive or managerial positions require as primary essentials, maturity and experience. It is quite probable that in some of these professional lines the ultimate solution will be that the person will take a definite amount of practical training for the historic occupation itself, and will then enter upon some field of practice with a view of returning, later, for advanced study toward managerial or other related

work. It has been proposed, for example, that a school for the preparation of superintendents and principals of schools should presuppose perhaps five years of experience as teacher before systematic study for the administrative work is begun.

V. Problems of Industrial Education

Because of the highly differentiated character of the trades and industries a series of problems arise in industrial education which have not yet appeared in other fields.

Problem 1. To what extent and under what conditions shall training be given for highly specialized occupations in manufacturing and other related callings where so-called "unskilled" or specialized service is in large demand?

For example, in the manufacture of cotton and woolen cloth, the number of specialized occupations is now nearly one hundred. Some of these seem to require little or no special training, and may be adequately supplied by the labor of children or women. In shoemaking it is said that the number of specialized operations for each of which individual workers are employed now reaches several hundred and is steadily increasing. Similar tendencies toward differentiation and specialization of occupation are found in food-packing, iron and steel working, small hardware and jewelry manufacturing, printing and publishing, the building trades, transportation, and even certain phases of agriculture, such as sugar production, wheat growing, etc. The building up of department stores, large jobbing houses, and the like in commerce increases, also in a large degree, specialization in salesmanship and clerical service.

(*a*) There is no evidence that the tendency toward extreme differentiation and specialization in occupational fields will be stayed. In proportion as economic units of production and exchange enlarge, supervision becomes more effi-

cient, and mechanical devices are invented and improved, so, it would appear, in almost all occupational fields specialization and the relatively large employment of unskilled service seem to increase. The persistency of this tendency will depend upon the economic advantages resulting from such specialization.

(*b*) On the other hand, from the standpoint of the individual worker, serious questions, as yet very slightly investigated, arise as to the psychological, moral, and physical effects of extremely specialized occupation. A large part of personal growth in character, physical powers, and probably also in mental capacity has always been dependent upon the occupation followed. Early specialization may conceivably result in partial or complete arrest of development in these lines.

It is probable, however, that specialization of occupation for one whose physical growth has been completed is much less dangerous than for one still plastic. Hence, while extreme specialization for a worker at 15 years of age may give bad results, the same may be not at all true if the occupation is entered upon at the age of 22 or 23. This represents a promising field for further inquiry and investigation.

(*c*) In the meantime there are good grounds for urging that all persons be given an opportunity for systematic vocational education, either in some trade requiring various operations, or over a series of the special operations found in a highly specialized manufacturing or other economic process.

Problem 2. To what extent and under what conditions can training for foremanship be organized and conducted?

In almost all fields of organized industry the post of foreman, overseer, or other special director of groups of workers is clearly recognized. Such posts commonly require (1) the degree of expert knowledge of the occupation which a

skilled worker is supposed to possess; and also (2) qualities not easily described, but related to leadership, capacity to direct workers, knowledge of human nature, organizing ability, etc.

(*a*) Foremen must combine, of necessity, native ability with high degree of training; hence almost invariably these must be selected men who have had considerable experience.

(*b*) Experience does not suggest that industrial schools can train foremen, as such, economically. Young people from 14 to 20 years of age can hardly be selected with reference to their native ability to serve as foremen. Hence, training in the special lines of knowledge required for foremanship would be largely wasted. On the other hand, when skilled workmen are selected after several years of experience for positions of foremanship they often find themselves handicapped for lack of the technical knowledge which foremen should have.

(*c*) Probably the need should be met by (1) a systematic course, offered to all alike, toward the occupational pursuit itself, followed by (2) opportunities at evening schools and short courses for workers who have had a few years' experience in the industry, further to qualify themselves if they desire.

Problem 3. To what extent shall prolonged courses of industrial training be offered to girls in industrial and other occupational fields, who, in the main, will spend but from four to seven years in the occupation, after which they will take up homemaking?

The Census of the United States shows that at the present time there are employed in this country a very considerable number of girls from 14 to 20 years of age. It is well known that the large majority, probably at least 90 per cent of these in the wage-earning callings, will take up homemaking as a career between the ages of 20 and 27. The problem of the industrial training of these, therefore, involves,

on the one hand, comparatively short courses of training, and, on the other, courses which will produce the maximum degree of efficiency in early stages.

Problem 4. Are there callings in industrial fields intermediate between those of a strictly professional nature, such as engineering, and those of a strictly trade nature, for which a large degree of technical instruction, as distinguished from practical training, is desirable?

It is sometimes alleged that there are such technical fields, for which, for example, the technical training offered in some of our high schools might be suited. Draftsmanship is sometimes alleged as an example, while in other fields such occupations as assaying, computing, and the like, may serve as examples. No sufficient analysis of these possibilities has yet been made.

Problem 5. What, at any given stage of vocational training for the industrial occupations, should be the proportion of time and energy of the pupil given, respectively, to technical instruction and to practical training?

Extreme and opposed examples of the problem under consideration are the following: (1) In the making of the machinist, a boy beginning at the age of 14 might devote his first two years very largely to such technical studies as drawing, mathematics, mechanics and shop exercises, together with shopwork and shop English, and on the other hand give a minimum amount of attention to productive shopwork of a thoroughly practical nature. Between his sixteenth and eighteenth years the proportion of time given to his shopwork might be very greatly increased, with a diminution of the amount of attention given to technical work.

(2) On the other hand, a program of training could be devised by which during the first year he might give from 60 to 80 per cent of his time to productive shopwork, with relatively only a small amount of technical instruction related to it. In his later years the proportion of time given to shop-

work might be diminished, and the proportion of time given to technical instruction might be greatly increased.

The problem involved is not one merely for a given individual, but one which shall meet the requirements of the large proportion of individuals as these present themselves for training. The first program might be the better for the person, if he could be found, who possesses inherent qualifications for foremanship; but it might prove exceedingly wasteful for that large majority of prospective workers in iron and steel who have little capacity for abstract thinking. The second program might prove much the better for the so-called "concrete-minded" people, and might also prove more effective for those who were capable of surviving four or more years of training as given.

VI. Problems of Commercial Education

The chief problems found in commercial education at the present time, apart from those involving its relationship to general education, are found in connection with the unanalyzed character of the occupations, from the standpoint of programs of commercial training.

Problem 1. To what extent should commercial occupations other than those of (*a*) accountancy and bookkeeping, (*b*) stenography and typewriting, be differentiated for the purpose of vocational education?

Statistics show clearly that in the commercial world approximately 80 per cent of the workers are found in fields of salesmanship, etc., as against 20 per cent in the specialized fields of accountancy, and stenography and typewriting. For the former occupations, however, little or no systematic vocational education is yet offered, in the main because requirements of these occupations that might be met by school vocational training have not been defined.

VII. Problems of Homemaking Education

The two chief problems connected with homemaking education at the present time are (*a*) those connected with the more effective coördination of that education with the home activities of the pupils and (*b*) those connected with the age at which it is efficiently practicable to begin systematic vocational homemaking education.

Problem 1. To what extent and under what conditions in a program of systematic vocational homemaking education can coöperation with the home be secured, and the equipment and facilities of the home be utilized for purposes of practical training?

(*a*) Every girl seeking a homemaking education must either live at home, in school dormitory, or under other conditions involving close contact with the various operations for which she is being trained. An efficient program of vocational homemaking education will involve the extensive use of the facilities thus offered.

(*b*) The problem presents different aspects, according as the vocational day school or the vocational evening school is under consideration. The principle is the same in both cases, however.

Problem 2. At what age is efficient homemaking education most practicable?

It is quite probable that there must be differentiation of groups for homemaking education, according to age as affected by the occupations followed. For example, it may be doubted whether girls who from 14 to 21 years of age will be wage-earners in occupations not related to the home, and who will be either living at home as boarders or in boarding houses, can efficiently respond to vocational homemaking education until somewhat late in their wage-earning careers. Again, when conditions of caste shall have been so changed that home employment on a wage basis shall be

attractive, systematic vocational education for this might well be begun at 14 or 15 years of age. In the case of girls not contemplating wage-earning careers, but who design to remain at home, systematic vocational education might well take place during the high school period.

VIII. Problems of Agricultural Education

Some examples now exist of successful programs of agricultural vocational education wherein the home farm is successfully combined with the school for instruction and for the direction of practical work. The two problems at present most pressing are (1) the provision of opportunities for practical training for city boys, and (2) the problem of combining secondary vocational agricultural education with preparation for higher institutions for the study of agriculture.

Problem 1. Under what conditions can boys living under urban conditions be provided with facilities for that portion of vocational agricultural education connected with practical work?

Experiments are being made in the direction of renting vacant land adjacent to cities for this purpose and putting boys in charge of their work on a project basis.

Problem 2. To what extent is it practicable for boys in the course of receiving a vocational agricultural education properly to qualify themselves for an agricultural college?

Obviously the requirements of an efficient vocational agricultural education are defined by the conditions of successful farming. It is not yet clear as to what should constitute the minimum requirements for admission to the agricultural college. Probably the college should distinguish in its work between degree work and courses of agriculture of a practical nature.

IX. Problems of the Administration of Vocational Education

The effectiveness of any form of vocational education depends largely upon the degree to which those directing it comprehend and respond to the practical requirements of the occupations for which training is being given. There arise, therefore, (*a*) problems as to obtaining teachers who have had experience in the occupation for which training is being given; (*b*) problems of keeping these teachers in intimate contact with the practical requirements of these occupations; (*c*) problems of maintaining or providing in connection with the executive authority in charge of the schools, specialists in vocational education; and (*d*) problems of providing, either in the legislative authority in charge of the schools or in an advisory relationship, representatives of the fields for which training is being given.

Problem 1. To what extent and under what conditions can teachers in vocational departments be equipped with practical experience obtained through actual participation in the callings for which they are giving education?

(*a*) Experience seems to prove that effective vocational education can only be given by persons who have had sufficient experience in a practical capacity, in a particular occupation, to enable them to succeed on a commercial basis.

For example, where normal schools undertake to train teachers for successful teaching (and not merely to teach prospective teachers certain subjects of study) experience seems to show that such teachers must themselves have been successful in the field of practical work. In medical colleges it is rare to find successful teachers who have not been commercially successful in practice. The best engineering teachers are those who have served some years at commercial work. In such trades as plumbing, pattern making, and others it is now agreed that a successful teacher must him-

self have reached a stage where he could readily procure profitable employment. The situation is not clear as regards commercial and agricultural teachers, but doubtless the same principles apply in these fields, as well as in homemaking.

(*b*) Granting the necessity of a considerable amount of practical experience on the part of teachers, the following are methods by which it could be obtained in conjunction with suitable training in the art of teaching: Vocational schools might take as teachers only persons who have already demonstrated their capacity in the world of practical effort, giving them in greater or less degree, just prior to their entrance on teaching, such training in the art of teaching as is practicable.

This method has been followed in the past by medical colleges, theological schools, and to some extent, engineering colleges and law schools. It is now followed by trade schools, and to a small extent, by schools of agriculture.

(*c*) A person seeking to become a teacher in a vocational field might take pedagogical courses, followed by a certain amount of practical experience as a prerequisite before taking up teaching. This is the prevailing method in normal schools and in some engineering schools.

(*d*) A course of training might be devised whereby the prospective teacher would first take a course in a school looking toward teaching, followed by one or more years of practical participation in commercial work, this to be succeeded by a definite period of study of the art of teaching, preliminary to taking a teaching position. This method is being proposed as a basis for the training of teachers of commercial subjects, etc.

Problem 2. To what extent and by what means shall teachers in vocational schools be required to keep in close contact with the occupational fields for which they are giving training?

It is probable that in fields like industry and agriculture

and others where changes are taking place efficiency can be produced only by strongly requiring that teachers shall not only observe but actually participate, on a commercial basis, from time to time in the work in fields in which they are giving training. The most available means to this end would be periods of leave given from the school, during which teachers should participate in such work. This practice is now found in some engineering fields.

Problem 3. To what extent and by what means shall specialized direction be provided in the executive administration of vocational education?

(*a*) The problem is one affecting (1) the headship of a department; (2) the directorship of a vocational school; (3) the general supervision of vocational education in an administrative unit, such as town or city; and (4) the administrative supervision of vocational education on behalf of the state, or other large unit of administration.

(*b*) It is assumed that the headship of a department must be in the hands of one who is a specialist himself in the occupation for which training is being given.

(*c*) The directorship of a large vocational school having several departments will probably not be in the hands of a specialist in any one department, but rather in the hands of one who is a pedagogical expert in many lines and a good administrator. Eventually, such a position will probably be filled by promotion from headships of departments, such selection being made on the basis of natural ability for an administrative position.

(*d*) There are good grounds for believing that in each city, or other administrative unit having many vocational schools, there should be an assistant superintendent specializing in the field of vocational education, including thereunder industrial, commercial, homemaking, and agricultural work offered, but not including professional. Whether he should also have supervision of the practical arts work as

a phase of general education or when offered prevocationally is doubtful.

(*e*) Similarly, where the administration of vocational education is supervised on behalf of the state there should be organized a separate department, dealing exclusively with vocational education.

Problem 4. To what extent and under what conditions shall representatives of the various vocational fields participate in the lay administration of vocational schools?

(*a*) It should be assumed that every single vocational department in a system should feel the influence of representatives of laymen in the occupational field concerned (including both employers and employees, where these distinctions are clearly defined).

(*b*) Obviously, it is impracticable to include laymen in this capacity in the school committee or board itself without making the latter unduly large. It may be assumed that a layman from one occupational field has not more capacity to assist in the administration of vocational education in another than any other layman.

(*c*) Experience seems to demonstrate that the more effective course is to place all vocational schools under the administration of the regularly constituted school authorities, because these are supported by public money, and to provide for each distinctive department a small advisory committee for the activity of which the department head shall be primarily responsible.

CHAPTER XIII

SOME FUTURE PROBLEMS

I

"Creative Impulse in Industry."— Miss Helen Marot, in her book under the above title (New York, 1918), has suggested one or more large problems of modern economic life which possess not only general importance but have also an intimate bearing upon all questions of future vocational education.

Miss Marot's book is in part a criticism of the present industrial order and in part a prospectus of a plan for developing certain special agencies whereby opportunity can be given for experience in giving exercise to the "creative impulse" in production.

So far as we can give concrete expression to our most fundamental conceptions of "highest human values," to the "life more abundantly" which seems always to have been the "purpose" of social and personal evolution, we find these "values" making, on the one hand, for the "happiness" of the individual and, on the other, for the "increase" of society. Among the factors making, in greater or less degree, according to the individual, for the development of individual personality, is the exercise of what we vaguely call the creative instincts. Demands for growth and self-expression are imperious in childhood; and their analogous qualities seem also imperious in some adults. On the other hand, the command to labor which was, according to one account, laid long ago upon Adam and his descendants, seems to have involved since then severe circum-

scribing of man's activities and probably suppression of a large proportion of the creative impulses of every individual.

Modern social economy cannot be less interested in the opportunities that make for enriched personality than in those that make for such social means to that end as security, wealth, righteousness, sociability, knowledge, and the like. Every effort looking to fuller and better general or "liberal" education looks to that end. Every advance in invention, the application of science and organization in production, and all use of natural powers as substitutes for human power in doing the work of the world, whereby man's rising standards of living can be met while at the same time reducing the hours required for production, are contributing to the same end through increase of leisure and the means of utilizing the same.

It is highly probable that we are as yet but at the beginnings of our educational efforts to give scope and enrichment to human personality. If the means suggested by Miss Marot can add to the process, they will be welcomed. But whether the objectives towards which she aspires can be realized along the lines she hopes — that is indeed a problem.

For it is apparent throughout Miss Marot's book that she has little confidence in the "present social order," at least in so far as it is organized by "business." Miss Marot reflects a social philosophy which, while very ancient in its essentials, has become more potent in recent years in proportion as economic systems have become more complex. It is a philosophy in which strong feelings, idealistic aspirations, formulæ, and facts are extensively blended. In this philosophy one finds reference made almost never to such elemental facts as limitations in the earth's producing powers, effects of increase of population, rising standards of wants, and the social need of conservation — of material

resources, human strength, working tools, order, and knowledge. It is a philosophy which premises the harmfulness, if not the malevolence, of certain types of institutions which have been of slow growth. On this philosophy she builds her refusals to approve certain current educational proposals and her advocacy of others. The following extracts are believed to be representative of this philosophy:

"Sometime the war will end and we shall be called then to face a period of reconstruction. The reconstruction will center around industry. The efficiency with which a worker serves industry will be the test of his patriotic fervor, as his service in the army is made the test during this time of war. All institutions will be examined and called upon to reorganize in such ways as will contribute to the enterprise of raising industrial processes to the standard of greatest efficiency."

"American business men before the war appreciated the educational system which made people over into workers without will or purpose of their own. But the situation was embarrassing as these business men were not in a position to insist that the schools, supported by the people, should prepare the children to serve industry for the sake of the state, while industry was pursued solely for private interest."

"Business is concerned wholly with utility, and not like workmanship, with standards of production, except as those standards contain an increment of value in profits to the owners of wealth. It was during the Guild period that business came to value workmanship because it contained that increment."

"The logical development of factory organization has been the complete coördination of all factors which are auxiliary to mechanical power and devices. The most important auxiliary factor is human labor. A worker is a perfected factory attachment as he surrenders himself to the time and the rhythm of the machine and its functioning; as he supplements without loss whatever faculties the machine lacks, whatever imperfection hampers the machine in the satisfaction of its needs. If it lacks eyes, he sees for it; he walks for it, if it is without legs; and he pulls, drags, lifts, if it needs arms. All of these things are done by the factory worker at the pace set by the machine and under its direction and command. A worker's indulgence in his personal desires or impulses hinders the machine and lowers his attachment value."

"The economic organization of modern society though built on the common people's productive energy has discounted their 'creative potentiality.' We hold to the theory that men are equal in their opportunity to capture and own wealth; that their ability in that respect is proof of their ability to create it; a proof of their inherent capacity. It is a proof, as a matter of fact, of their ability to compete in the general scheme of capture; their ability to exploit wealth successfully."

"Modern industrial institutions are developed by an exclusive cultivation of people's needs and the desire to possess is responsible for the production of a mass of goods unprecedented and inconceivable a century and a half ago. The actual production of all of these goods is unrelated to the motive of men's participation in their production; the actual production in relation to the motive is an incident."

"It is almost axiomatic to say that a system of wealth production which cultivated creative effort would yield more in general terms of life as well as in terms of goods, than a system like our own which exploits creative power. It is obvious that the disintegrating tendency in our system is due to the fact that production is dependent for its motive force on the desire to possess."

"Before scientific management was discovered, business management and machinery already had robbed industry of productive incentives, of the real incentive to production: a realization on the part of the worker of its social value and his appreciation of its creative content."

"Nevertheless the intention of all and the spirit of the scheme is to do as near nothing as possible in exchange for the highest return. The whole industrial arrangement is carried on without the force of productive intention; it is carried forward against a disinclination to produce."

"It is incredible to factory managers that workers object to being taught 'right' ways of doing things. Their objection is not to being taught, but to being told that some one way is right without having had the chance to know why. This resistance to being taught, it seems, is nothing more or less than a wayward desire of a worker to do his own way because it is his way, and of course from the managers' point of view, that is stupid."

"A responsible part in which production does not mean merely doing well a detached and technical job; it means facing the risks and sharing in the experimental experience of productive enterprise as it serves the promotion of creative life and the needs of an expanding civilization."

"The creative significance of a product in use, as well as an appreciation of the act of creating, would be evident if modern production of wealth, under the influence of business enterprise and machine technology, had not fairly well extinguished the appreciation and the joy of creative experience in countries where people have fallen under its influence so completely as in our own."

"It is the present duty of American educators to realize these two points: that industry is the great field for adventure and growth; that as it is used now the opportunities for growth are inhibited in the only field where productive experience can be a common one. Shortly it will be the mission of educators to show that by opening up the field for creative purpose, fervor for industrial enterprise and good workmanship may be realized; that only as the content of industry in its administra-

tion as well as in the technique of its processes is opened up for experiment and first-hand experience, will a universal impulse for work be awakened."

"It is for educators to realize first of all that there can be no social progress while there is antagonism between growth in wealth (which is industry) and growth in individuals (which is education); that the fundamental antagonisms which are apparent in the current arrangement are not between industry and education but between educational business."

"The craftsmanship period is valued in retrospect for its educative influence. There was opportunity then as there is not now for the worker to gain the valuable experience of initiating an idea and carrying the production of an article to its completion for use and sale in the market; there was the opportunity then also as there is not now, for the worker to gain a high degree of technique and a valuation of his workmanship."

"Educators have opposed the desire of business to attach the schools to the industrial enterprise. They have rightly opposed it because industry under the influence of business prostitutes effort."

"The ideas which we find there have not sprung from schools or colleges but from industry. The institution of industry, rather than the institution of education, dominates thought in industrial education courses. It is the institution of industry as it has affected the life of every man, woman and child, which has inhibited educational thought in conjunction with schemes for industrial schools. No established system of education or none proposed is more circumscribed by institutionalized thought than the vocational and industrial school movement."

Speaking in terms of social evolution the development of what we call "industrialism"— which is primarily a series of phenomena growing out of the harnessing of natural powers such as wind, steam, electricity and gas — is but of yesterday. It is inevitable therefore that it should still be attended by many pathological conditions which society has moved too slowly to correct. No one could wish to disparage sincere and intelligent efforts to provide remedies or initial correctives to those now existing.

On the other hand, radically destructive proposals commonly confound the subject and the disease. It is poor economy to tear down a leaking house when neither time nor means are at hand to build another. Because Miss

Marot's strictures are echoed by many other educators opposing vocational education for what is sometimes mistakenly called "efficiency," they deserve examination no less than the attendant proposals.

The two most fundamental social facts in the modern industrial system are the multiplication of population and at the same time rising standards of living or increased desire for consumable goods. To meet these conditions men tend towards maximum use of capital and the tools it will purchase, regimentation and specialization of service from that of the highest executive to the lowest paid operative, and delegation of function to the one best qualified by nature and training to perform it. These are the lines of least resistance, the apparent optimum resultants, the "fit" that seem destined to survive.

Miss Marot is right in thinking that one of the undesirable by-products of this is, at least for some individuals, the stifling of the creative impulse. But what about the facts, especially on the historical side? Does Miss Marot think we have gone backward in this matter since 1776, or 1496, or 476, or 350 B.C.? We must, of course, be careful of our logic in making inferences here. Booker Washington used to protest against the unconscious habit exhibited by most people in comparing blacks and whites: they usually compare the best white man with the worst negro. He suggested that we try the exercise of comparing for a time good negroes with bad white men. Are we to think that the *average* (or statistically modal) stone-cutter, or weaver, or shoemaker, or wheat grower, or gold miner (omit the prospector), or brick-wall builder, or bottle maker, or sailor, or food packer, has less opportunity for exercise of creative impulses than had the average man in these fields hundreds or thousands of years ago? Or does she think the average small Alabama cotton grower, Labrador fisherman, New England farmer, Chinese gardener, Illinois farm housewife,

rural school teacher, village maid-of-all-work, office general clerk, country grocer, Mexican goat farmer, have greatly better opportunities for exercise of creative impulse than average locomotive engineers, coal miners, specialty teachers in large schools, New Bedford weavers, Waltham watchmakers (eighteen-year-old girls), department store clerks, Grand Rapids furniture makers, or Detroit automobile makers? I think the naïve assumptions now widely prevalent about these matters do considerable violence to individual psychology and to sociology. How do the men and women in these various fields compare in looks, health, zest for life, and cultural outlook at age 30? 45? 60? The occupations given in the first group above are but slightly as yet affected by "economic organization of modern society"—hardly at all as respects outlets for creative impulse.

Everything practicable should be done to enhance opportunities, whether on the primitive farm or in the home with its necessary composite of elemental operations; or in the shoe factory or department store, for exercise of creative impulses. But it is no use following Utopian visions in this matter or disregarding the fairly fixed facts of life in the individual and in the group. When a process, like, say, the planing or surfacing of wood, or the mixing of concrete, or the washing of dinner plates, has become standardized and the machinery for its performance well developed, the process may have to be repeated millions of times as routine. When experience shows that it is more effective for a train dispatcher to plan movements of trains and an engineer to receive and follow directions, one result is a shutting out of experiences which were combined in one man in days of "teaming." But why rebel? We certainly cannot go back? Any one of us, obliged to fight, would greatly prefer to be a soldier in a small guerrilla band of equals than a trench fighter on the recent French front. But the guerrilla soldier is practically valueless in modern defense.

Miss Marot quotes on page 81: "The big electrical engines which are being introduced in the railroad system are rapidly eliminating the factors of judgment on the part of the engineer and transforming that highly skilled trade into an automatic exercise."

That is true. But railroading did the same for stage-driving; and stage-driving did the same for "packing" on muleback; and muleback packing did the same for the man-carrying which still survives in China and the mountains of South America. But will the electric locomotive engineer be less of a man than the stage-driver or the Chinese long-distance porter? Look at them in Grand Central Station.

Now it is extremely doubtful whether the "average man" of any considerable group in America is to-day less well off in any of the obscure essentials of happiness than the corresponding man among his ancestors in the eighteenth, thirteenth, or fifth centuries, or among corresponding men to-day in China, India, Australia, or Argentina. It is, of course, statistically demonstrable that as respects certain concrete "values" he is decidedly better off. But, the idealists contend, he should be better off in all respects, and he would be if he had his deserts — if some more or less mystic agents of evil did not perpetually despoil him. To this the sociologist must reply with much doubt, "possibly; but how can you establish it?" Individual instances prove nothing; and passionate aspirations no less than passionate antipathies are poor guide-posts to knowledge.

None of us reject either the characterizations or the hopes expressed in William Vaughn Moody's "The Brute"; but we have the right and obligation to study and select the means which will realize the desired ends. It seems highly probable that the harnessing of science and natural powers in economic production means increasing regimentation, specialization of inventive function, and narrow routine performance. But we can afford to pay a considerable price

in these if they bring us doubled leisure, facilities for growth, security and abundance of the enduring goods of life. Is labor an end in itself? It has never been esteemed such in sound social philosophy. It is a means to "life more abundantly," as are the economic goods which are its outcome.

II

Democracy and Education. — In his book on the philosophy of education — Democracy and Education (New York, 1917) — Dr. John Dewey devotes one chapter to the "Vocational Aspects of Education," besides making reference to vocational aims in other chapters. Dr. Dewey has also dealt with problems of vocational education in various articles in journals.

The present writer finds himself in agreement with much that Dr. Dewey urges, both by way of criticism of historic forms of school education, and of positive proposals for the improvement of that education. The reconstruction of school curricula, at least for children under twelve years of age, along lines suggested by Dr. Dewey, will without doubt prove of very great value to the individual as well as to society.

But in what Dr. Dewey writes about contemporary social situations (in their economic aspects) as these constitute backgrounds for proposals for vocational education, as well as in what he suggests by way of criticism of current proposals for vocational education, the writer finds it very difficult to discover the foundations of practicable programs either for social policies in general or for educational policies in particular. This difficulty is increased by the fact that Dr. Dewey rarely discusses the problems of vocational education in concrete terms of the age groups, vocational specializations, and limitations of native abilities which are the unescapable realities of all contemporary social life as

that presents itself to social economist and educator everywhere.

No well-informed educator will take exception to many of the criticisms of historic forms of education set forth in the chapter referred to above. Undoubtedly much of past and even of current discussion of vocational education, as well as of liberal education, has involved deeply entangled philosophical dualisms. But, from the standpoint of the recent writings of the proponents of widespread development of publicly supported vocational education, as well as from that of dictionary makers who seek to crystallize popularly accepted meanings of terms, is it helpful to say, as a contribution to a definition of vocation, "A vocation means nothing but such a direction of life activities as renders them perceptibly significant to a person, because of the consequences they accomplish, and also useful to his associates"? Nor does it seem helpful to make "vocation" synonymous with "occupation" or "career." Again, when Dr. Dewey says, "The dominant vocation of all human beings at all times is living — intellectual and moral growth," he is using the term in an unrestricted way that entails confusion of thought for many.

For several years it has seemed to many of us much more serviceable, as well as in accordance with popular understanding as interpreted by the makers of dictionaries, to restrict the term "vocation" to that more or less continuous (in the sense of being taken up day after day) occupation by which adults primarily produce the exchangeable services or commodities essential to their support. Temporarily, a man may have other occupations than his vocation, just as, permanently, he may have one or more avocations besides his vocation. A man's occupation outside of hours devoted to his vocational life may be that of recreation, or extending his personal culture, or helping his wife in her vocation — that of homemaking — or in drilling for military service,

or in forwarding the ends of his political party. The word "career," on the other hand, seems more inclusive than vocation. It includes not only the idea of vocation successfully pursued, but its consequences on social position, prestige, opportunities for leisure, etc.

Because, historically, the welfare of man as well as that of his family has depended so greatly upon the success wherewith he pursues his vocation, it has been natural for that vocation to hold a central or primary place among the activities with which he concerns himself — and especially as he becomes purposive, self-controlled, and "civilized." Furthermore, it has been natural for society to think of man in terms of his calling more frequently than in terms of his other occupations, just as it frequently happens that a man's dress, manners, facial expression, and even mental and social characteristics are often greatly affected by his vocation. Nevertheless, as "civilization" advances, society probably thinks less rather than more in terms of the man's vocation, partly because the range of his possible activities outside his calling, especially in urban communities, becomes more extended. Of four persons at a club largely indistinguishable in dress and manner, one may be, as to business, a lawyer, another a bank cashier, another a college teacher of modern languages, and the fourth a real estate dealer. By their non-vocational activities they are variously designated as Catholics or Unitarians, Republicans or Socialists, golf-players or hunters, family men or bachelors, and the like.

Of the artisans going home after an eight hour day's work, one may be a horseshoer, another a stairbuilder, another a riveter, and a fourth a pattern-maker. But they, too, have their varied non-vocational activities in which they may join coöperatively with each other, or occasionally coöperatively with the clubmen above.

It seems to be a social fact of general application that the more primitive and undifferentiated a man's vocation, the

more it seems to affect and control all his other activities. The primitive farmer, sailor, fisherman, hunter, domestic servant, priest, homemaker, teacher, and small trader seem to follow their respective vocations three hundred and sixty-five days in the year and twenty-four hours in the day. But is this a condition approved by men possessing the advantages of high vocational competency and good general intelligence? Is it not a fact that for these the ideal is "work while you work, play while you play"? In all high-grade professional, commercial, and agricultural pursuits (and one sees signs of it too in military, navigational, and homemaking pursuits) there is an increasing tendency for each person to have a definite working day or schedule of working hours, after which, having produced a sufficient amount of those economic goods (commodities or service), whereby he becomes entitled to his needful share of the goods produced by others, he turns to his other activities — to his avocations, and his recreations, or to his religious, political, domestic, social, or cultural duties.

It is in the light of these tendencies that the following passage from Dr. Dewey's chapter referred to above must be examined:

"We must avoid not only limitation of conception of vocation to the occupations where immediately tangible commodities are produced, but also the notion that vocations are distributed in an exclusive way, one and only one to each person. Such restriction of specialism is impossible; nothing could be more absurd than to try to educate individuals with an eye to only one line of activity. In the first place, each individual has of necessity a variety of callings, in each of which he should be intelligently effective; and in the second place any one occupation loses its meaning and becomes a routine keeping busy at something in the degree in which it is isolated from other interests. No one is just an artist and nothing else, and insofar as one approximates that condition, he is so much the less developed human being; he is a kind of monstrosity. He must, at some period of his life, be a member of a family; he must have friends and companions; he must either support himself or be supported by others, and thus he has a business career. He is a member of some organized political unit, and so on. We naturally

name his vocation from that one of the callings which distinguishes him, rather than from those which he has in common with all others. But we should not allow ourselves to be so subject to words as to ignore and virtually deny his other callings when it comes to a consideration of the vocational phases of education."

Vocational Specialization. — Now, whether we like it or not, it is a fact that vocational specialization is the rule in the modern economic order. It has proceeded far in those callings collectively designated as commercial and industrial. It is steadily proceeding in the professions and agriculture. It seems the inevitable accompaniment of the efforts of men, confronted by the pressures resulting from increasing density of population and rising standards of living, and aided by the possession of invented tools, scientific knowledge, ambitious leadership, and reserve capital. The more able and enlightened men and women of our time in all lines are seeking opportunities to do their economically productive work — the part constituting their vocations as here defined — in highly specialized fields. If we compare the specialized productive vocations of California, Massachusetts, or Wales on the one hand, with those of Turkey, Bengal, or Shantung Province on the other, the distinctions between old and new, archaic and modern, retarded and progressive, will at once appear.

Dr. Dewey seems to feel that this subdivision of labor is undemocratic besides being otherwise undesirable:

"Any scheme for vocational education which takes its point of departure from the industrial régime that now exists, is likely to assume and to perpetuate its divisions and weaknesses, and thus to become an instrument in accomplishing the feudal dogma of social predestination. Those who are in a position to make their wishes good, will demand a liberal, a cultural occupation, and one which fits for directive power the youth in whom they are directly interested. To split the system, and to give to others, less fortunately situated, an education conceived mainly as specific trade preparation, is division of labor and leisure, culture and service, mind and body, directed and directive class, into a society nominally democratic. Such a vocational education inevitably discounts the scientific and historic human connections of the materials

and processes dealt with. To include such things in narrow trade education would be to waste time; concern for them would not be 'practical.' They are reserved for those who have leisure at command — the leisure due to superior economic resources. Such things might even be dangerous to the interests of the controlling class, arousing discontent or ambitions 'beyond the station' of those working under the direction of others. But an education which acknowledges the full intellectual and social meaning of a vocation would include instruction in the historic background of present conditions; training in science to give intelligence and initiative in dealing with material and agencies of production; and study of economics, civics, and politics, to bring the future worker into touch with the problems of the day and the various methods proposed for its improvement. Above all, it would train power of readaptation to changing conditions so that future workers would not become blindly subject to a fate imposed upon them. This ideal has to contend not only with the inertia of existing educational traditions, but also with the opposition of those who are intrenched in command of the industrial machinery, and who realize that such an educational system if made general would threaten their ability to use others for their own ends.

"But this very fact is the presage of a more equitable and enlightened social order, for it gives evidence of the dependence of social reorganization upon educational reconstruction. It is accordingly an encouragement to those believing in a better order to undertake the promotion of a vocational education which does not subject youth to the demands and standards of the present system, but which utilizes its scientific and social factors to develop a courageous intelligence, and to make intelligence practical and executive."

Now it is certainly true that in the present industrial régime there are all sorts of undemocratic possibilities. But are these inherent? If so, how do we explain the fact that with perhaps one exception, modern industrialism has advanced farthest in countries and regions most noted for political democracy — Scotland, Massachusetts, northern France, northern Italy, Michigan? One does not look for modern industrialism in Turkey, Russia, India, China, or Egypt, notwithstanding their natural resources and their pressure of population.

Vocational vs. General Education. — It is one of the most pronounced contentions of the proponents of effective and democratic vocational education (for all, that is, — a few

leaders, as Dr. Dewey properly says, have long had these opportunities in the undemocratic order of the past) that one effect of modern specialization of occupation is to render impracticable any considerable blending, on the one hand, of vocational and non-vocational education, and on the other of vocational education for one vocation with that for another. In actual administration this should mean that each pupil should complete, to the fullest extent practicable, his non-vocational or liberal full-time education (largely designed to prepare him effectively for the non-vocational duties of life) before beginning his necessarily specialized vocational education, and that thereafter his liberal education should be continued outside of " working hours."

Vocational education, it must repeatedly be said, consists only of divisions or subjects of all possible instruction and training which primarily prepare one for the effective exercise of vocation over that span of years during which it is, or normally should be, followed. In practice, we think of the vocations of the barber, poultry grower, bookkeeper, tailor, sailor, high school teacher of physics, grocer, dentist, machinist, stenographer, house carpenter, cattle grower, priest, army officer, miner, and the like as filling up a long span of life, and for each of them specific vocational training and instruction — in a special school or elsewhere — is quite conceivable. It is true that for the successful pursuit of all or most of these vocations good health, good moral character, and literacy are also valuable or essential. But, in greater or less degree, the qualities and powers included under these terms are valuable or relatively essential alike for all the vocational, as for the no less important non-vocational, activities of life. Hence these become the proper aims of general or non-vocational education. It is only to the production of those specific skills and forms of knowledge wherein the dentist differs, as respects the production of economic goods, from the barber that the words vocational education, properly or in best recent usage, apply.

Now this may mean educational dualism, but if so, it is a dualism based upon the present and probable future realities of life. But it is in reality a kind of pluralism of ends by which we are confronted. We do not teach singing by the same means, in the same places, or at the same times that we teach arithmetic. We expect the man or woman consciously and purposefully to differentiate play from work; and in all good domestic or school régimes we expect young people, at least those upward of twelve years of age, to do the same, in the degrees appropriate to their development. In our well-ordered life, we differentiate seasons for sleeping, for eating, for friendly social intercourse, for concentrated work; and no less, we differentiate the processes of training and instruction by which we habituate the young to these respective spheres or types of activity.

It is certainly true that a man's various activities sum up into a kind of unity, as does a house, a farm, a tree, the human body, or any other composite of more or less interdependent parts. But, for practical purposes, we can consider not only separateness of part or function, but also the special means of producing or improving specific part or function.

For many readers the fact that Dr. Dewey does not carry his discussion to the point of at least illustrating by concrete reference to age groups proves a source of uncertainty and confusion. With such a statement, for example, as "the only adequate training *for* occupations is *through* occupations" all *can* agree. But when he says, "to predetermine some future occupation (vocation?) for which education is to be a strict preparation is to injure the possibilities of present development and thereby reduce the adequacy of preparation for a future right employment," we find ourselves in agreement or disagreement according to the age and other conditions of the particular persons under consideration. Would Dr. Dewey apply this dictum in the

case of a young man of twenty who, one or two years before completing his general college course, makes up his mind, on his own initiative, or is even induced to do so, that he will specialize in preparation for the practice of medicine on graduating from college? If a young woman, pressed by family circumstances to become self-supporting at a relatively early age, is advised to enter normal school at eighteen years of age and take the training required to make her a good elementary school teacher, will this "predetermination" injure her possibilities of future development? But it is still a social fact as it always has been, that the great majority of young people elect, or are obliged, to become productive workers (often in juvenile vocations, of course, from which they will seek other vocations more suited to adults when they acquire the requisite maturity, experience, and, in some cases, training) between the ages of fifteen and eighteen. It is highly desirable, certainly, that, as far as practicable, these early choices of vocations should not be final and irrevocable — and nowhere has freedom to shift from calling to calling been further developed than in America. Towards assisting and rendering more effective this mobility of labor — its present wastefulness is appalling — agencies of vocational guidance and of vocational training at the right stage should be developed to the utmost.

If, however, Dr. Dewey has in mind the possible vocational predestination of young children or youths yet far removed from the necessities of entering upon productive work, then of course the best of sociological and educational opinion is entirely in accord with him. Under these conditions, we can heartily approve his recommendation that " the only alternative is that all earlier preparation for vocations be indirect rather than direct." But, in fact, where vocational specialization has proceeded far — as in the modern industrial and commercial center — it may be doubted whether much of an " indirect " nature can be accomplished

that will function later as specific vocational competency. Hence it may prove most effective to preserve as dominant aims in all earlier education, physical, moral, and cultural growth and training, as these are required for a common basis of good citizenship and good personality, irrespective of the particular vocation to be entered upon later. That as large a part as practicable of this "general" education should consist of means and methods designed to enable the youth to "find himself" as respects the vocations most suitable for him in later years goes without saying. No item of his "social education" is more important than this.

Educative Values in Vocations. — One other problem discussed by Dr. Dewey is certain to give difficulty to the social economist and educator. Dr. Dewey is right in analyses of present industrial and commercial specialization (pp. 366–68). Without doubt, "while the intellectual *possibilities* of industry have multiplied, industrial conditions tend to make industry, for great masses, less of an educative resource than it was in the days of hand-production for local markets." Precisely: and it is for just this reason that many educators hold as necessary the conscious differentiation of education for citizenship from education for vocation. We may say, indeed, that modern production, as a condition of economic efficiency, tends to regiment its workers as workers; but it should not, and does not, if properly safeguarded, regiment them as citizens or cultured personalities.

For the sake of a fairly illuminating comparison, let us press further the analogy between an industrial and a military army. In each specialization of function proceeds very far. Workers, according to their inherent and acquired powers, are variously differentiated for the performance of specialized forms of work. A few highly gifted and trained persons are placed (either by democratic election or by imposition from outside) in positions where planning on a large scale and far in advance of the event is required.

In many connections and at many levels, specialists are at work performing detailed functions and effecting specific coördinations.

Now it is generally conceded that in each type of army, multiplication of functions has gone so far that it is utterly beyond the power of even the most gifted person to acquire even moderate appreciation, to say nothing of executive mastery, of the various specialized processes involved. The president of a railroad system is never expected, however able, to be a locomotive engineer, tunnel digger, train dispatcher, freight agent, repair shop superintendent, or conductor. The general in the army is never expected to be an aviator, signaler, machine gun operator, truck driver, surgeon, or paymaster. But neither is it practicable, even if it were ideally desirable, for the locomotive engineer to understand, in any technical sense, the plans of the directors to extend their trackage, to petition for higher rates, to begin the systematic training of telegraphers or to adopt a new style of freight car. It is not practicable for the machine gunner to know the plans of those "higher up" with regard to feeding the army next winter, or improving on range finders, or taking steps to lessen communicable diseases. In all these cases, we are in the presence of limitations inherent in the very conditions of modern social organization.

On the other hand, in political democracies the soldier and the industrial specialist, whether of high or of low rank, are also citizens and more or less cultured individuals (*i.e.* socially perceiving and feeling personalities). In these capacities, like all other citizens and cultured individuals, they should have the fullest practicable opportunities of comprehending, enjoying, and reacting upon the world of which they are a part. The soldier votes upon questions that affect the policies of the army of which he is a part; but no less he must also vote upon questions that affect the railway system of which vocationally he is no part. The

locomotive engineer is expected as a well-informed man to know something of the significance of the railway system in which he is one instrument; but, no less, he is expected to know also something of the other railway systems, of his country's army system, and of all other social agencies which make up the vital elements, civic and cultural, in the world of which he is a part.

It is apparent that Dr. Dewey, as all other persons sensitive to the pathological situations produced by the modern industrial order, greatly desires educational readjustments that will, as he hopes, tend to remove the limitations implicit in the systems described above. What many of us doubt is the practicability of achieving the desired ends along the lines indicated by Dr. Dewey. In so far as the suggestions contained in the following paragraphs can be carried out in schools of general education, he has our hearty support. But in so far as he makes these proposals as possible contributions to programs of vocational education, they seem purposeless and futile:

"Both practically and philosophically, the key to the present educational situation lies in a gradual reconstruction of school materials and methods so as to utilize various forms of occupation typifying social callings, and to bring out their intellectual and moral content. This reconstruction must relegate purely literary methods — including textbooks — and dialectical methods to the position of necessary auxiliary tools in the intelligent development of consecutive and cumulative activities.

"But our discussion has emphasized the fact that this educational reorganization cannot be accomplished by merely trying to give a technical preparation for industries and professions as they now operate, much less by merely reproducing existing industrial conditions in the school. The problem is not that of making the schools an adjunct to manufacture and commerce, but of utilizing the factors of industry to make school life more active, more full of immediate meaning, more connected with out-of-school experience. The problem is not easy of solution. There is a standing danger that education will perpetuate the older transitions for a select few, and effect its adjustment to the newer economic conditions more or less on the basis of acquiescence in the untransformed, unrationalized, and unsocialized phases of our defective industrial régime. Put in concrete terms, there is danger that voca-

tional education will be interpreted in theory and practice as trade education: as a means of securing technical efficiency in specialized future pursuits.

"Education would then become an instrument of perpetuating unchanged the existing industrial order of society, instead of operating as a means of its transformation. The desired transformation is not difficult to define in a formal way. It signifies a society in which every person shall be occupied in something which makes the lives of others better worth living, and which accordingly makes the ties which bind persons together more perceptible — which breaks down the barriers of distance between them. It denotes a state of affairs in which the interest of each in his work is uncoerced and intelligent: based upon its congeniality to his own aptitudes. It goes without saying that we are far from such a social state; in a liberal and quantitative sense, we may never arrive at it. But in principle, the quality of social changes already accomplished lies in this direction. There are more ample resources for its achievement now than ever there have been before. No insuperable obstacles, given the intelligent will for its realization, stand in the way."

Obviously the questions here raised by Dr. Dewey are sociological first and educational second. Society, in its profounder evolutions, uses education as a means; and it is, of course, true that the education of to-day determines in part what the next generation shall think and feel. But educators are prone to lose sight of the fact that throughout all historic times education has been the *means* employed by the controlling forces in society; it is merely a pleasing fantasy that educators as a class have any extensive control of this means. The "social forces" growing out of man's instinctive nature, out of the economic limitations which surround him, and out of the social inheritance which he has created must largely determine what, in any age and clime, shall be the directions taken by those servants of the majority will, the educators.

Hence, when Dr. Dewey speaks with confidence of the "unrationalized and unsocialized phases of our defective industrial régime" he may or may not be suggesting practicable opportunities to the educators. It is clearly not the business of the educator with his inexperience to tear down

existing social structures of long standing and slow evolution in the vague expectation that he, with the aid of some school children, can rebuild them along sound architectural lines. Nor would it seem worthy conduct in him to stand aside and refuse to share in amending present conditions because, forsooth, he thinks they should be reconstructed in their entirety.

Of course education should operate as a means of transforming the industrial order — provided we have some reasonable assurance as to the practicable courses of such transformation. But we can only put into the schools to-day what the statesmen, writers, scientists, philosophers, enterprisers, warriors, and inventors thought out clearly or did effectively yesterday. Until the scouts and the adult vanguard have reached some agreement as to the roads ahead, the plastic generation in the rear must hold to the tried paths — any other course means ruin.

It is not to be understood that Dr. Dewey himself advocates, on the part of educators, as regards the present "industrial order" either revolution or even "passive resistance." Only when his conclusions shall have been given concrete analysis and application to specific situations can we be certain just what their significance is. With his desire that general education in all grades shall, as a means of promoting good citizenship and democratic culture, employ to the fullest realistic contacts with the vital pulsating environment — an ideal eloquently elaborated in the third chapter of H. G. Wells's *New Machiavelli* — all educators are in profound sympathy. Rightly conceived and realized, that ideal does mean "education for an industrial society" — liberal education, that is; but it has little to do with vocational education. That is something different, sociologically and psychologically. We shall be able to learn what it is only as we take up the actual economic strands of contemporary social life and study them one by one, free from emotional prepossession and self-deception.

CHAPTER XIV

PROBABLE ECONOMIC FUTURE OF AMERICAN WOMEN[1]

Any comprehensive program of vocational education must be designed primarily to prepare young persons for the effective exercise of productive vocations as now found; it may be designed secondarily and incidentally to anticipate probable social changes in the character and incidence of vocational activities; and, under some circumstances (taking due account of the relatively fundamental and only slightly controllable character of economic forces), to further desirable, and to restrain undesirable, economic tendencies by its emphasis on one or the other of different possible educational objectives.

It is well known that the economic position of women has already changed greatly during the last century, and conspicuously in communities in which productive work is chiefly of an industrial and commercial character. It is probable that many of the economic changes now in process will continue along lines already established, some of their social, cultural, and physical consequences becoming increasingly evident. But it is also certain that societies in which concerted and intelligent action, looking toward conservation of the best in human resources and the promotion of higher social standards generally, has become an established policy, will insist on securing improved conditions for the development of the young, and with especial emphasis on sound family life. The mother of children is the logical primary custodian of children's well-being; and in their rear-

[1] This chapter in substantially its present form first appeared as a paper in the American Journal of Sociology.

ing will be found, inevitably, the best vocation for many women — best for the individual herself and best for the society which she serves.

For training in the performance of all forms of economic service, including the rearing of children, women in the past to an extent even greater than in the case of men, have been dependent upon the by-education of productive service itself as carried on by elders. The daughter has learned the thousand practical arts of homemaking as an assistant to her mother, supplemented by the trial-and-error methods of her own home when responsibility for its conduct fell to her lot. The domestic servant has learned under the direction of mistress; the tiller of the soil under leadership of field foreman or forewoman; the factory hand under shop overseer; the clerk under employer or supervisor. For only a few women's callings — teaching, nursing, stenography — have the methods of unorganized or organized apprenticeship been replaced by systematic vocational training.

But no student of contemporary social conditions or of current proposals for improvement in our social economy can doubt that an enormous extension and improvement of systematic vocational education under public control and direction is inevitable in the near future. The provision of universal and perfected means of direct vocational education at the proper time (usually after the essential foundations of liberal education shall have been laid) clearly constitutes one of the most necessary stages toward the good citizenship, the social efficiency, now being sought in our complicated societies. It is hard for us to realize that almost in proportion as economic processes become scientific and highly organized, the possibilities of getting reasonably satisfactory vocational training as a by-product of early participation in productive work itself — possibilities that were very large under primitive conditions of production — steadily diminish. Hence the need for vocational training as

itself a specialized stage or process apart from, or closely guarded within, the productive processes themselves. Such segregated vocational training is certainly not less needed to-day for women, than for men, workers; and, in spite of the necessarily primitive and composite character of the domestic vocational arts, it is probably not less needed as a means of efficient homemaking than as a means of effective service in commercial, industrial, agricultural, and professional callings.

At present, very naturally, all programs for the vocational training of girls and women are largely provisional and even opportunistic. In fact, they are based primarily upon first-hand appreciations, not of social needs in general, but of certain marked socially pathological situations that have been seen vividly, first by social workers, then by educators. But to a constantly increasing extent, these programs must come to be based upon scientific knowledge of what are the established or probable fields of women's work; the probable transitions in economic service that will be made by women of given classes, ages, and abilities; the physical, social, and cultural concomitants of each prevailing type of work; and the most effective reasons and means of giving and testing definite vocational training therefor.

It is the purpose of this paper to analyze certain problems, as yet largely unsolved, relative to the probable economic future of American women during the twentieth century, on the assumption that present tendencies will continue in directions already established; and, in the light of the probabilities described, to suggest possible policies and programs for the vocational education of girls and women. As a preliminary to the analysis of these problems, it seems desirable to summarize briefly certain general conclusions as to which it is believed substantial agreement among well-informed students of economics and social life generally exists. These are:

1. Women, normally, have always been producers of economic service no less than men.

2. Productive work has always been largely differentiated between men and women as to location and character.

3. The admission of woman to non-domestic occupations, though attended by great difficulties, is now substantially an accomplished fact.

4. Woman's participation in non-domestic occupations promises to be increasingly regulated by law, in the interests of a sound social economy.

5. The effective rearing of children in the capacity of wife and mother must always have priority of importance as woman's work.

6. Few effective means of vocational education for non-domestic employments have yet developed for women.

A. SOME ACCEPTED POSITIONS

1. *Women as producers.* — In all normal societies, and in all but a few exceptional cases of individuals and small classes, women have always been producers of economic service equally at least with men. (The term "economic service" is here used to include the rearing of children, leadership in planning and directing work, defense of the state, socially approved commercialized entertainment, and teaching, no less than the production of material utilities.) It is a reasonable expectation that women will, in proportion to their strength and ability, always continue to be, no less than men, producers of valuable service. From time to time in past history, as well as at present, wealthy and powerful men have been able and have preferred to maintain their wives, daughters, and female entertainers in that half-parasitic condition which enhances their æsthetic and convivial attractiveness. This practice is clearly traceable to beginnings in ages of conquest when the men of the conquering class reserved to themselves the vocations of fighting, lawgiving, and general administration. It has rarely affected so large a proportion of the population in the past as to lead to disastrous eugenic consequences; but the effects of segregating from useful service a substantial proportion of women and of making of them a non-productive "decorative" class

may be proving disastrous in areas where great industries and commerce have enabled, not 1 or 2 per cent, but 10 or 20 per cent of strong men to become so prosperous that they can carry into effect their very natural ideals of maintaining their wives in idle luxury, their daughters in parasitic uselessness, and their entertainers in a state of "conspicuous," but socially unproductive, consumption. But it is to be expected that the increasing social insight of our time will soon forewarn and forearm us against this form of social disease. (See Olive Schreiner's *Woman and Labor.*)

2. *Differentiation of productive work.* — In all societies of which we have record there have existed tendencies, never wholly complete, toward differentiation of productive work along sex lines. Defense and aggression against animals and hostile humans has fallen largely to men, probably in part because of their greater mobility, and in part perhaps because of their greater share of the combative instincts (as in some animal species). The care of young children (including the giving of much early by-education) seems naturally to fall to women, partly because the physical condition of their functions requires them to be less mobile and undoubtedly because maternal instincts making for child care are stronger than are the paternal instincts to the same end, especially as applied to very young children.

On these foundations, as societies have evolved, many other differentiations have taken place. Men, being first warriors and hunters, have then become trappers, explorers, sailors, fishermen, drovers, traders, miners, and lumbermen. Women become cooks, weavers, dressers of skins, food packers, gardeners, milkers, brewers, builders, wood gatherers, nurses, and teachers of little children. Old men and handicapped men shared early in the more home-centered occupations. When more roving occupations failed, men in the settled regions have often seemed to specialize in those forms of productive service requiring most sustained and

greatest physical strength, especially if these occupations are carried on at some distance from the home. Occupations of building, heavy tillage, transporting, and merchandising thus fall to men, although in all primitive societies where women seem to develop bodily strength nearly, if not wholly, equal to that of men, and especially when war or slavery forces men away, women seem readily to become heavy tillers and bearers of burdens — occupations which probably they have never more than partially surrendered.

The invention of machinery and the use of power have often had the effect of centering production in factories away from the home; and apparently men first fall heir to these new vocations, such as baking, machine weaving, machine shoemaking, iron and steel working, brickmaking, brewing, milking, food packing, etc. Certain occupations — originally domestic and apparently shared equally by men and women, especially healing and religious ministry — became early monopolized by men, while others, like entertaining, teaching, lore transmitting, literature making, etc., have after a period of such monopoly returned to the state of being "open" to men and women equally.

In modern industrial and commercial societies, so much productive work is centered in factories, office buildings, large stores, and other places far removed from the home that we have, conspicuously in all urban communities, and visibly even in rural communities, the phenomenon of women wage workers — that is, women who no longer render their service in the family unit (and receiving payment, not in money, but in kind) but in places and conditions unconnected with the home. The United States Census for 1910 shows that of all the enumerated inhabitants the following percentages of each age group were engaged in "gainful" occupation:[1]

[1] *Fourteenth Census*, IV, 73

	Age 10–13	Age 14–16	Age 16–20	Age 21–44	Age 45 and upward
Males....	17 per cent	41 per cent	79 per cent	97 per cent	86 per cent
Females..	8 per cent	20 per cent	40 per cent	26 per cent	16 per cent

Of the more than eight million women wage workers (in "gainful" occupations) included in these figures, probably about one million are domestic servants; the rest are following occupations away from the home and having no direct connection therewith. The figures from previous censuses show that the proportions of women wage workers are steadily increasing (the percentages in 1900 were for the respective age groups about 6, 18, 32, 21 and 13).

3. *Difficulties of transition to non-domestic employments.* — The increasing necessities laid upon women to find opportunities for productive service away from the home have naturally resulted in conflicts of ancient custom with new conditions. Where rising standards of living had released women from hard and grimy manual occupations — tillage of soil, harvesting, milking of cows, drawing of coal in mines, wood carrying, fish cleaning and distributing, as practiced in Europe, were early tabooed by the prosperous American settler for his "women folk" — it has been deemed degrading for women to resume them. Probably, also, acquired physical disqualifications for such "masculine" employments, due to more "delicate" rearing, have played an important part in preventing any return to them.

Where men had long monopolized certain attractive occupations (preaching, practice of law, medicine, teaching in mixed or boys' schools, clerical office work — until after the Civil War — "political office-holding," indoor salesmanship — until the eighties — telegraphy, machine-shop work, tailoring, dentistry, pharmacy, architecture, and engineering), there had naturally developed strong prejudices against the entrance of women competitors. All sorts of barriers, some due to motives consciously mean and selfish, others to commendable, even though short-sighted, desires to keep women out of "non-wholesome" surroundings, abnormal work, or employment that might impair the home, have been raised. Very naturally, in those to whom the wish must be father

to the thought, it has been conceived that woman's strength of body or, no less often, of mind, could not be equal to the requirements of the work as standardized for men workers.

When strikes or war deprive a given field of employment of male workers, employers naturally seek to recruit their forces with women, if immigrant or colored men are unavailable. This "unfair" competition of women with men arouses keen apprehensions and leads to prejudices that long survive the events that provoke them. Women workers organize, or act in organized ways, less readily or effectively than men; hence where the workers of a given field — shoemaking, cigarmaking, bookbinding, typesetting, telegraphy, tailoring, and other similar fields — have secured and are maintaining advantages through organization each threatened invasion of "scab" women workers is bitterly resented. In some fields of highly subdivided labor, the superior nimbleness and powers of concentration of girl workers are a perpetual irritation to their less dexterous brothers and male cousins.

For these, as well, doubtless, as for more obscure reasons, resting on vague instinctive reactions (some of which, perhaps, are sounder than appears on the surface), the way of woman's advance into the fields of wage-earning work has been made painful and often degrading. Nevertheless, opposition has steadily given way. There now exist in law or fixed custom relatively few obstacles to woman's entry upon any calling that may be elected. Vexatious handicaps and restrictions of a more or less disguised nature are still found in large numbers, of course, especially in transitional stages; but substantial and organized opposition is found only where invasion threatens to break down the standards of protection and compensation painfully secured through long efforts of organized labor.

Hence we can assume the early removal in almost complete measure of the factitious barriers to woman's entry upon

any field of work she may seek, and her undisturbed right to participate in its rewards and to share in responsibility for its development so far as this may be consistent with her other obligations to society and to herself.

4. *Social regulation of women's non-domestic work.* — Statutory regulation of the conditions of women's work represents a social tendency of very modern development, and yet it is already so deeply rooted in our best ideals and practice of social economy as reflected by scientific thought and by legislation that we must accept it as an established conditioning force in relation to woman's place in the modern economic world. This regulation by law of the conditions under which women may work is unquestionably designed in the interests of woman's obligations to society and to herself.

In America and those other civilized nations that have shared in the "industrial revolution" we already see embodied in legislation many provisions regulating the participation of children in wage-earning work; and along with these appear statutes governing for women, hours of labor, factory conditions, night work, minimum wage, dangerous employments, and amount and quality of toil as related to time of childbirth. Unless present tendencies shift radically, we may expect a continuous development of regulatory laws and ordinances of this character; and, if scientific knowledge and sound social ideals prevail, we may expect them increasingly to provide for the protection of the health, moral character, standards of living, and family responsibilities of the worker as well as, in respects not included in these, to insure that she discharge in best practicable ways her responsibilities to society as citizen, mother, defender, and producer. In the case of any given individual and for a given space of time, much of this regulation will seem unduly restrictive and even repressive; and, indeed, under poor direction, it may easily become that, no less than the ancient

regulatory ordinances of king, church, and guild. Nevertheless, social needs here will clearly have the ascendancy, in part because of the fact that so many women wage workers are young and insufficiently coöperative, and therefore easily exploited; and in part, because of their supposedly low resisting powers, as compared with men, against low standards of living, excessive hours, moral exposure, and physical hardship.

5. *The effective rearing of children.* — The struggle of an individual to live — to obtain a living and to maintain a desired standard of comfort — need not necessarily involve service valuable to the community nor responsibility for the maintenance of a family or the rearing of children. In the struggle of any given composite social group to survive and advance itself, however, it is inevitably required that first consideration be given to the conditions that make for the effective rearing of children. But the possible contributions respectively of men and women to the rearing of children are necessarily differentiated. In the long run a given society dare not permit either men or women in any substantial numbers to subordinate their family responsibilities to other ends. The pursuit by a people of permissible economic objectives must, for the great majority, be in chief measure a means to wholesome family life (the central and controlling function of which is successful child-rearing), else such a people will perish. In some far-off day society may find means of delegating most of the work of child-rearing to special agencies; but current proposals to that end are usually utopian.

With advancing standards and more intelligent social and private control, we may assume that, as contrasted with the present, the following will progressively be the essential features of family life as relates to the effective rearing of children: (*a*) the burdens (and compensating satisfactions) of rearing children will be more evenly distributed than at present — involving somewhat larger families for the more

intelligent and prosperous, and somewhat smaller families for others than prevail now in America; (*b*) for a society not willfully static nor deteriorating in numbers, each normal family will be expected to bring to maturity three children or more according to prevailing rates of marriage, sterility, etc.; (*c*) marriages will be more intelligently made, and will be entered upon with greater preparation for the responsibilities involved; (*d*) children, and especially very young children, will be better cared for, and the death-rate among them will steadily diminish; (*e*) until the state subsidizes the rearing of all children (an expedient frequently proposed, but unlikely of adoption in the near future) it will give financial assistance only to mothers who, having established approved marriages, are through unforeseen contingency deprived of the needed coöperation of husband — widows' pensions, allowances to wives of drafted soldiers, and injured workers, etc.; (*f*) where service needed in the rearing of children can best be given by the mother, she may expect to be forced and, if necessary, assisted, to devote herself to that work; and where service can best be given by agencies other than the home — school education, health inspection, etc. — it is to be expected that these will be maintained at public expense.

In general, a sound society must insist on proper and adequate motherhood, and will protect it as far as is socially practicable.

6. *Vocational education for non-domestic employments.* — By vocational education is here meant any and all forms of experience-getting, instruction, training, and supervision which finally make the worker productive, including the poorly organized training of simple shop experience under supervision, as well as the systematized training of apprenticeship and trade school. The very conditions under which women have followed productive callings away from the home have prevented the development of valuable private or

public training except in a few fields, such as nursing, teaching, and clerical work (chiefly stenography). The woman worker has been introduced first as helper to more skilled male workers or as a specialist on highly subdivided processes as spinner, cartridge filler, buttonhole-maker, folder, garden weeder, can filler, labeler, file clerk.

Furthermore, she has seldom come in to " learn the business " — as, not infrequently at least, has her brother. She has had necessarily the attitude of a casual laborer taking a temporary job. Experience convinced her employers that in 80 or 90 per cent of all cases she would leave early to get married. Often she has been less than a casual laborer; she has been a child earning " pin money," and contributing for a time toward her own support in her parents' home. As a girl she neither wants to stay permanently, nor does she care especially to be advanced to more complicated work. The very processes by which work has been subdivided and mechanized to fit her powers and limitations have wiped away traditions of apprenticeship and beliefs in importance of definite vocational training. The chief function of the employment manager becomes to pick girls of most promise of native ability; and the forewoman (or, often, foreman) may be trusted soon to " fire " those who could not " make good."

Except in a few lines of work (*e.g.,* telephone service, select office service, and department stores catering to custom somewhat above the average, in which some good special private vocational training has already been developed) the employers of women workers have always been in sharpest competition with each other, and ready at all times to " steal " each other's best workers; hence any given employer was practically precluded from giving his workers special training; he would only find his best workers stolen and himself the poorer for his efforts.

From the standpoint of making the work of young, unin-

terested, untrained girl and women workers productive of useful service, the modern industrial and commercial manager has wrought wonders through his use of machinery and organization — as expressed in massing of capital, use of inventions, development of speedy power-driven machinery, subdivision of process, perfection of supervision, advertising for help, penalizing specific forms of incompetency, etc. Cloth manufacture, department-store merchandising, cartridge making, bookbinding, watchmaking, fruit and meat canning, cigarette making, clothing manufacture, drug packing, telephony — these and many other similar lines represent wonderful modern organizations of production; but they do not usually involve the systematic vocational education of workers and, probably, may not be expected to do so in the near future. The very success of this form of enterprise has indeed led to the conviction that training for occupation is nonessential where machine production can be organized on a gigantic scale — a clear case, of course, of reasoning *post hoc ergo propter hoc.* Because we see a thousand productive processes evolved to utilize the services of the untrained girl, we assume that the trained girl of equal age will find only these processes available for her. But to accept this conclusion would mean the abrogation of all of society's supposed powers of invention along educational lines. Are only competing employers original and inventive? To train girl workers for non-domestic vocations will give us many problems; and these will be analyzed and solved. But it is futile to expect competing employers to solve or even to state them for us.

That woman in the twentieth century will be largely free to enter upon any productive work that she may elect, subject to that degree and kind of state regulation that will insure protection of the state's interest in her well-being; and that it is possible and profitable for society collectively,

through the state, to undertake to fit her for such work — these are the preliminary theses upon which to base a study of the numberless particular problems for the individual woman and for society which have already developed and which may be expected to continue to develop in connection with her efforts to fulfil the destiny laid upon her originally, we are assured, by Eve, who, in the words of William Vaughn Moody, lived to sing to the Lord:

> Behold, against thy will, against thy word,
> Against the wrath and warning of thy sword
> Eve has been Eve, O Lord!
> A pitcher filled, she comes back from the brook,
> A wain she comes, laden with mellow ears;
> She is a roll inscribed, a prophet's book
> Writ strong with characters.

B. UNSETTLED PROBLEMS

The economic transitions of recent centuries, and especially in the countries where "industrialism" has progressed farthest, have given rise to many difficult social problems, some of which, at least, seem more acutely to affect women than men. Among the most pressing of these problems are those discussed below.

1. *Combining domestic with non-domestic work.* — During the transition period wherein has developed extensive employment of women in non-domestic industries, there appear many cases in which women simultaneously carry on homemaking and work outside the home.

(*a*) Tillage of the soil, harvesting, fish cleaning and drying, milking, herding, wood gathering, and some other semi-domestic occupations, having been in large part woman's work long before the "industrial revolution," have persisted in all primitive communities. Colored women in the South, peasant women in all the continental countries of Europe and Asia, and recent immigrants to America, by reducing home work to a minimum, by developing much muscular power

and physical endurance, are obviously able to bear many children, to bring some of these to a rugged maturity, and at the same time to perform what is frequently described as a "man's work" away from the home.

(*b*) In manufacturing and commercial centers, there are found many families in poor financial circumstances. In these, fathers are usually dead, deserters, invalided, or dissipated, or else are employed irregularly or in some unskilled, poorly paid work. As a consequence, the mothers, simplifying their home work to the utmost, seek wage-earning employments. They work in mills, as "day" domestics, as cleaners of office buildings, and in other fields in which unskilled laborers, made energetic by desperate necessity, are in demand.

(*c*) A few women of superior talent — actresses, singers, teachers, writers, saleswomen — have, after marriage, continued to follow apart from the home the productive service in which they had become adept before marriage. As a historic fact, many of these women have, naturally or voluntarily, remained sterile; but in other instances they have reared normal families, aided by employed domestic service.

(*d*) A small number of mothers, having brought a normal number of children to that degree of maturity where their immediate demands for "mother-care" have been less pressing, have resumed former employments or undertaken new work away from the home, sometimes as a means of furthering personal development or as a means of adding to family income.

2. *Homemaking as an exclusive vocation.* — But in the large majority of cases in all countries where a substantial portion of the population has reached a comfortable standard of living, work outside the home for the married woman is held in disapproval both by expert and by popular opinion.

(*a*) Where young men and young women are both engaged in wage-earning, it is customary for them to abstain from marriage until, in each case, the man's income is believed to be sufficient to "maintain a home" — which implies the expectation that the wife shall be relieved of obligation to work for wages and shall be free to give her time exclusively to the upkeep of the home and the care of the children expected in it.

(*b*) The laboring man whose wife must "go out to work" becomes an object of pity or contempt according to the degree to which he is culpably responsible for such necessity.

(*c*) It is generally conceded that in the case of all families having young children and modal incomes — in America this might well mean children under fourteen or fifteen — the absence of the mother in wage-earning work operates to the serious physical and moral detriment of the children unless substitute care be provided. Such detriment must, obviously, be interpreted in terms of an approved real or expected standard of living, as this makes for physical and moral wholesomeness. It is clear that a rising standard of living means new requirements on mother care.

(*d*) Families in exceptionally good financial circumstances have long followed the practice of delegating care of children in large part. Employed nurses and tutors take charge during younger years; and in England the boarding school claims many boys and some girls after nine or ten years of age. Whether the rearing thus provided is equal or superior to that which the mother, devoting her energies primarily to her children, could give, is yet an open question; but in view of the very small number of families to whom this delegation of parental responsibilities is financially practicable, the question is of small importance. Once in a million cases, perhaps, we can find a Madame Schumann-Heink who can, by virtue of unusual physical strength

and exceptional talent for a non-domestic vocation, render great service away from the home and at the same time rear a fine family; but social programs can hardly be based on cases so exceptional.

3. *Demands for "better families."* — In the evolution of conscious social policies relative to the homemaking vocation, to supplement the present social inheritance of customs and traditions based partly upon old human instincts and partly upon empirical experience accumulated under the spur of necessity, it is clearly urgent that the conditions of effective homemaking in accordance with modern approvable standards should be analyzed, delimited, and described. What constitutes optimum "mother-care" of infants and children? To what extent, under what circumstances, and at what financial cost can that care, in whole or in part, be delegated? To what extent, under what circumstances, and to what advantage, financial or other, can the pursuit of occupations supplemental to, or in substitution of, mother-care be profitably followed by the mother?

It is needless to state here that from the standpoint of social evolution the primary function of the home is the rearing of children during the prolonged years of "infancy" which has become a racial condition in the human species. The adequate maintenance of the home, at least in temperate zones, has entailed the monogamous and life-long union of the father and mother, and, as a consequence, the home serves the important secondary function of being a place of rest and recreation for the father, who is of course essentially a non-domestic worker. The mother, as homekeeper and children's guardian, develops various kinds of domestic productive service, which are best generalized under the term "homemaking." In all normal societies it can be assumed that the two parents contribute equally to the complete support of the home. Under special circumstances —

e.g. where men extensively develop social habits of dissipation, where prosperous men put a premium on the decorative functions of wives and daughters, in settlement of the frontier, or where, after a long period in which men have specialized in defensive functions and women in manual toil, conditions of peace are established which do not for a time diminish the woman's work, but permit the man to exist in comparative idleness — the men in some of these cases, or the women in others, are forced to make a disproportionate contribution, whether of labor or of suffering; but such conditions occur only in exceptional classes and periods.

Rising standards of living and changing conditions due to civilization impose upon both parents larger responsibilities, often only partially offset by increase of knowledge, of productive power due to invention, etc. A longer period of parental protection for children; diminished mortality and morbidity rates; more adequate nurture, clothing, shelter, and education; more "social" advantages; later entry upon self-supporting employment; a "better start in life" — these become goals, individual and social, of family rearing in all civilized societies. The three most visible effects of these rising standards are: the mother must give fuller personal care to her children, especially in their younger years; the father must increase his output of productive service in order to procure the exchangeable goods necessary for family support; and the state undertakes certain functions — *e.g.* education, and, in less measure, health supervision and relief of destitute — which parents cannot well perform.

A secondary social product of these rising standards appearing in recent years, and especially in most progressive societies — as judged at least by conventional standards — is the voluntary diminution of the number of children to be reared, and, by inference and expectation at least, the more adequate rearing of this diminished number. A first man-

ifestation of this tendency is found in the postponement of marriage among many classes, and especially the professional; a second, in the diminished marriage rate, at least in some societies, of the socially "unfit" — the dissipated, the defective, and the ne'er-do-well; a third, in the social disapproval of excessively large families — the "rabbit warren" type — especially among the poor; and a fourth, in voluntary restriction among the sensitive and intelligent of the size of family to that which is in a measure compatible with the interests of the parents in the proper rearing of their children, the conservation of the health of the mother, and the building up of a capital reserve for the parents in their old age.

That the possibilities of restricting size of family in the interests of quality of human beings reared can be and are subject to gross abuses is unquestionable. Without doubt, an undue number of men now forego marriage altogether, some from the most selfish of motives. Some men, and doubtless some women, remain celibate because of the acquisition of excessively developed qualities of so-called refinement, which represent in reality only refined selfishness. It is certain that in countries like France, New Zealand, England, and America, where social caste has broken down and ascent in the social scale is easy, a disastrously large proportion of married couples evade altogether or in large part their obligations to society as regards insuring families of proper size. Motives for this are varied, ranging from the completely selfish to those involving, perhaps, a misguided sense of social gain to result from the success of the unhandicapped man in art, science, business leadership, war leadership, or social prominence.

"Down to Gehenna or up to the throne,
He travels fastest who travels alone."

It is still, of course, a complex unsettled problem as to how far the entire range of powers and capacities of the

mother of a normal family, capable of being devoted to productive service, may not be required for child-rearing, especially during the years from marriage to the time when the youngest child shall be at least twelve years of age. In the case of a woman marrying at twenty-three years of age and rearing four children, it is reasonable to assume that her personal care will be closely required on behalf of her children until she is forty-two years of age. It is furthermore here offered as a contention that by all modern standards the family responsibilities of such a mother during her twenty most active years must claim substantially all her effective working time and energy. Society may be expected increasingly to look upon the supersession of maternal duties, either by voluntarily assumed or by enforced labor in non-domestic vocations, as in the nature of a misfortune to the rising generation. Variations from this principle there will undoubtedly be; but they will arise from circumstances so exceptional that they will be of the nature of those variations from the normal, the justification of which on the part of given individuals will entail a substantial burden of proof.

4. *Domestic versus non-domestic vocations.* — What are the relationships likely to prove most common between woman's work in homemaking and her work in non-domestic employments? The history of recent decades points to the following possible answers:

(*a*) The postponement of marriage together with the withdrawal of many kinds of productive work from the home has rendered it necessary for the daughters of the family, no less than the sons, in large numbers to seek openings for productive service away from the home. This is especially true of communities devoted largely to industrial and commercial pursuits. For example, the Census of 1910 shows the following proportions (percentages) of women of each age group engaged in "gainful" occupations:

State	Females 10–13 Years	Females 14–15 Years	Females 16–20 Years	Females 21–44 Years	Females 45 and Upward
	Percentage	Percentage	Percentage	Percentage	Percentage
Massachusetts...	.3	24	60	39	18
Iowa.....	.7	9	29	20	9
Pennsylvania....	1.3	21	44	23	13
Kansas.....	.7	4	22	16	10

All of these figures are rendered difficult of interpretation for the purposes in hand here by the fact that the fourth age group includes at least two or three and, for certain higher economic levels, probably four to six years of the usual "premarriage" wage working years of the women involved. Nevertheless, it is clear that in all states, and conspicuously in those predominantly industrial and commercial, from one fourth to nearly two thirds of all women give their "premarriage" years (after school years close) to non-domestic employments; and there is little reason to expect that this condition will change in the direction of increasing the proportion of domestic work.

(*b*) Where regular home employment is insufficient for mother and growing daughters numerous attempts are made to bring wage-earning, non-domestic work into the home. In cities the addressing of envelopes, feather-work, novelty work, and piecework (for example, sewing on of buttons, etc., on manufactured clothing) are sought. In a few country areas the manufacture of cheap cigars by the farmers' wives and daughters in the home has proven profitable. But no general developments in this direction can now be traced, and the trend of "sweatshop" legislation, as well as the opposition of social students to the probable incident abuses (hygienic, forced child labor, etc.), would seem to indicate that such forms of work have little future. The development of electrically driven textile and other machinery has led to some extravagant hopes that each home may once again become what it formerly was in some cases — a little

workshop for the whole family. For the present these expectations must be regarded as utopian. Problems of organization, supervision, and transportation seem insurmountable. The natural lines of development of non-domestic work for rural women would seem to be in the direction of soil tillage and light stock raising; but these also as "extra-home" vocations for women seem to be diminishing rather than increasing.

(*c*) It is here assumed that, as stated before, society cannot well expect or even permit non-domestic "full-time" wage work for women after marriage and during the time when children are still young.

(*d*) Could "part-time" wage-earning work for mothers be approved? If a mother cannot teach a full day, could she not teach a half day? Could not mothers living near factories give four or five hours daily to wage-earning? These questions are often raised; and public interest in them is such that much experimentation may be expected in the near future. The theoretic possibilities of good arrangements of this sort seem strong; but some of the most formidable obstacles to them are generally ignored. Modern production involves a constantly enlarging proportion of capital (tools, housing, etc.) and organization (supervision, regimentation, routine) in proportion to labor. To an increasing extent labor must work according to schedule, else waste of capital (idle tools, etc.) and excessive cost of "overhead" service — supervision, planning, etc. — become inevitable. The outlook for part-time service, especially if the "part-time" must also be somewhat irregular, is not promising, but nevertheless requires fullest experimentation.

(*e*) Can women, after children are grown, find profitable non-domestic employment? The answer involves the same difficulties as those discussed under (*d*) above, and the added one that these possible workers would be past the age at which they could readily learn new processes. Here,

also, close analytical studies of existing situations and experimentation seem highly desirable.

5. *What are "suitable" types of work for women? —*

(*a*) It can readily be assumed that most women, by instinct and as a result of custom inheritance, are peculiarly qualified for "homemaking" work as that has evolved through the ages. But where homemaking is required of a highly trained and gifted woman, it may seem in individual instances socially less productive than other work for her. To what extent and under what circumstances can she delegate homemaking? Some problems arising in this connection have been discussed above.

(*b*) It is probable that old preconceptions as to the "intellectual unfitness" of women for certain types of work will have to be put into cold storage during the twentieth century, at least until a time when more scientific evidence relative to general dissimilarities between men and women as to intellectual quality shall have been accumulated and interpreted. Only relatively few men, of course, are capable of meeting the intellectual standards set by the age for scientific research, practice of a profession, military leadership, teaching advanced students, literary production, business leadership, etc. Whether, given the same social incentives and opportunities, the percentage of women who could attain to equal proficiency is smaller or larger is certainly not yet known.

(*c*) Among economically prosperous peoples it seems that women develop less physical strength and those kinds of hardihood that we customarily identify with work in the open than do men. As a consequence, it is customary to assume that women cannot do many of the kinds of heavy work in which men frequently engage. This impression is heightened by the fact that among many of the best-known mammals and birds the female is less strongly built than the male. On the other hand, among primitive peoples and

the economically less prosperous tillers of the soil to-day (Asia, Central Europe) women by custom carry on much heavy work, and, apparently, develop bones and muscles hardly less strong and capable of enduring long and heavy work than those of men. At all stages in recorded history, where the ideal of the "decorative" woman has prevailed among the leisure class or workers of high rank, girls of these classes have been reared with standards of small feet, slender waists, half-developed muscles, and soft skins in view. The product has often been a much, if not excessively, feminized woman, who, among her other defects of specialization toward the "beautiful," includes a greatly diminished capacity for heavy physical toil and endurance. The same results would happen and frequently have happened to men as effects of similar ideals and consequent practices. How far, therefore, we must accept as inherent woman's alleged natural disqualifications for heavy work — lifting, tilling, building, digging, portering, mining, etc. — seems yet an open question.

If, however, it should prove that, naturally, a smaller body and less physical strength are the portion of women in general, or that women should, on account of possible injuries to organs essential to child-bearing, be spared "heavy work," then the consequences in vocational education will be important, although probably less important as mechanisms employing natural powers become perfected. The same results would follow, of course, if it should appear that those decorative qualities in women which seem to require certain kinds of physical underdevelopment should prove to be more than adventitious assets to society. Conceivably, it may be very important, from the standpoints of æsthetic demands, sexual selection, etc., that all women should be schooled and shaped to the physical attractiveness and delicacy formerly possible only to the wives, daughters, and specialized entertainers of the conquering and the wealth-holding classes.

If this be so, then we shall differentiate indoor salesmanship, teaching, light factory work, and the like as suitable employments for young women during their premarriage years, because, on the one hand, these young women, softly reared, will prove unadapted to heavier work, and because, on the other hand, they will thereby avoid those forms of toil which most handicap them as regards physical attractiveness. Obviously, the unsettled problems here are numerous, intricate, and perhaps, until we shall know more about social psychology, baffling. But it is highly probable that, owing to natural or social fitness, men will prevailingly continue to fill some occupations and women others. The reasons for this differentiation may be economic rather than physical and social. But, as the place and circumstances of a given occupation change, it may well pass from one sex to another. Milking, baking, and skin-dressing, once tied up with the home, first were women's work; but, away from the home, they become men's occupations. The work of the street-car conductor was formerly heavy and disagreeable to an extent that marked it out manifestly for men; but when the job becomes one chiefly of collecting fares in the protected entrance of a car, there is no reason why it should not be given to a woman, or, more properly, a girl.

6. *Can men and women workers expect equal pay for equal work?* — There are many obscure elements involved in this problem. It has previously been suggested that, under average economic conditions, women do *as much* work as men. This is very different from saying that men and women can compete on equal terms in non-domestic (or, obviously also, domestic) forms of employment. The following special problems are involved:

(*a*) It is essential that "pay for work" should be thought of as far as practicable in terms of exchange of economic utilities and not in terms of the counter "money." Men and women work, primarily, in order that they may

produce, beyond the products of their labor which they can themselves consume, products which can be exchanged for the required products of others. It is practically impossible to designate absolute "values" for these products; all experience shows that, except in the case of collective interference with demand in the interest of health or safety, the "values" attached to various forms of service and product are the resultants of demand and supply. Private individual or corporate effort can interfere somewhat with the operation of the law of supply and demand in regulation of values (as expressed in prices), as through corporate monopoly, trade-union regulation, fashion, advertising, education; and the state through minimum wage laws, sumptuary regulations, state monopoly, can also cause some marked divergences from the normal values determined by the free operation of the law. Nevertheless, like sea-level as a base of earth measurements, or year-round average temperature in a given area, the resultant values given by the law of supply and demand can never be ignored or greatly departed from. In general, then, it may be assumed that when the demand for the services or the products of any class of workers is large and the supply of such service or product small, a relatively large quantity of "exchangeable" goods will be offered; and, when reversed conditions prevail, a small amount; and that neither custom, private monopoly, nor law can more than slightly affect this resultant.

(*b*) Society does not now subject children, dependent poor people, the sick or the aged, those severely handicapped physically, or those who, like soldiers, are temporarily drafted for public service, to the struggle involved in the competitive industrial order. But it does require normal adults to be "self-supporting," which means, in fact, that these are expected to sell their services in the best possible market, and that buyers of such services or their products will strive to get them at the best possible (buyer's) price.

Broadly speaking, then, a given normal child from birth to perhaps sixteen consumes more economic service day by day than he produces, the adverse balance being largest from perhaps nine to sixteen. Thereafter he produces more than he consumes until perhaps sixty-five years of age, the maximum favorable balance being between the years twenty-five and fifty. From sixty-five to death at eighty, this individual consumes more than he produces, apart from the service rendered to society by even the very old man as "capital holder." It is from sixteen to sixty-five, in this case, that the law of supply and demand regulating wages operates.

An extreme school of collectivists would abrogate the operation of the law of supply and demand by establishing the principle "to each according to his needs, from each according to his ability," which is now, on any given economic plane, the custom-based practice as regards children. But for the present we must assume among independent adult workers the nearly free operation of competition in buying and selling services (or their products). Under these conditions, subject to slight offsets from custom and monopolization, "equal pay for equal work" will certainly prevail; and the pay will always be that for which the cheapest worker can be had. This process will necessarily be obscured (perhaps in a measure departed from) in public service (*e.g.* public school teaching) where standards of service rendered are indefinite and the employer—"the public"—seems possessed of unlimited means of adding to the compensation of workers alleged to be "underpaid." Similarly, in the case of large corporations having great assets and not subject to keen competition, sentiment or fear may for a time force wage rates to artificial levels, doubtless often the case with "high officials" and sometimes with the rank and file of workers.

(*c*) But in almost every case it is practically certain that men and women will not work alongside each other on terms

of economic equality. The "pull" of economic demand for persons of a given grade of native ability, training, and adaptability will not operate equally. For example, to one thousand men chosen at random, economic opportunities are now available of such kind and quantity as to make, let us say, elementary school teaching at present rates of compensation a tenth or twentieth best calling; whereas to an equal number of women it is now a first, second, or, possibly in some cities, a third best calling. Naturally and inevitably, unless society places a special premium on men because they can render a kind of service that women cannot render, such teaching will become "woman's work" and the men will strive toward those callings which pay better.

(*d*) A very large factor in this economic differentiation, although obscurely recognized at present, is the difference in demands being made upon men and women workers respectively. For a given economic level, it may be assumed that during the years constituting the "premarriage" period for women in large numbers, youths and maidens will impose demands for wages only slightly above the living expenses of the individual. But between ages twenty-five and fifty, in the large (and therefore controlling) majority of cases the situations of permanent men and women workers (in the case of women, chiefly celibate) change in marked degree. The permanently single woman at twenty-six may, and, in the case of teachers, nurses, etc., often does, have as many "dependents" as men of the same age; but at forty-six society expects the man to have four to seven dependents, whereas the single woman, who is the only frequent competitor, now, commonly, has only herself. Because this is so in the controlling number of cases for a given social plane of intelligence, standard of living, and natural competency, all components of the "demand" made by the class collectively for exchangeable goods (the measure of normal wages), men workers from twenty-five to fifty will

strive to preëmpt fields into which women cannot fit; and, equally, women will be given almost exclusive possession of those forms of work which they can do best. Some of the stronger of the women will always be looking longingly into the fields given to the men; and their potential rather than real competition may be expected always to be a source of irritation, apprehension, and recriminating discussion.

7. *Women in the professions and leadership.* — To many young women of ability and ambition come, very naturally, aspirations to prepare themselves for those professional callings, as well as forms of leadership, for which many years of expensive training and of poorly remunerated apprenticeship are essential. Many capable women of middle age who are in their own thoughts permanent celibates, become ambitious to be promoted to positions of authority and leadership for which their abilities and experience seem to qualify them. In these cases women have always encountered obstacles more or less factitious, the vestigial remains of which still are found.

The problems involved here are by no means solved, however, when artificial barriers to training and promotion have been removed. Take, for example, the practice of medicine as a profession; should we recommend it as a desirable vocation to a young woman of requisite ability and interest? Persons preparing for this profession usually embark on its study at or about twenty to twenty-three years of age. They will probably be thirty years of age before they can expect to be self-supporting. Cost of training is heavy, both to the individual and to the state (or, in lieu of state support, philanthropic endowments provided for the encouragement of this professional training). Granting that a properly qualified woman who remains single can build up and maintain a good medical practice, should the *young* woman be encouraged to undertake the preliminary steps involved? We should first, of course, decide as far as prac-

ticable whether, for the woman prepared to practice medicine, homemaking and family rearing are compatible with a professional career. Instances of the successful union of the two we have, of course; but do they prove the desirability of the attempt in general? Or should we assume that the woman who wishes to prepare herself for a difficult profession should, in effect, pledge herself to celibacy?

Similar problems arise in connection with leadership as found in such posts as foreman, school principal, department-store buyer, hotel manager, etc. Most of the women who work at teaching, manufacturing, store salesmanship, and clerical service are young; during their earlier years of service they usually expect to marry, and often their interests in matrimonial prospects constitute an absorbing preoccupation. At the time when the best men workers in these fields are just beginning to feel that their experience constitutes a solid basis for further study, many of the best women workers terminate their wage-earning careers. Those who find it desirable or necessary to go on are apt to come late to the conviction that they should begin to qualify themselves for promotion to directive work. Should we endeavor to induce the ablest of these workers early to begin to plan for promotion? The situation in public education is a good example. From 75 to 90 per cent of all teachers in the elementary and high schools are women. Beginners of both sexes start on a substantial parity as regards compensation and duties. But positions of direction go chiefly to men. Prepossessions of employing authorities — that women principals cannot manage big boys, that women teachers do not work so well under women principals — play a part in this, but probably not a great part in recent years. More marked is the indisposition of women teachers (except kindergartners) during the ages from twenty-four to thirty to take leads, to show professional initiative, to prepare for advanced work.

Obviously, problems involved in women's relationship to vocations exacting long preparation must be studied in the light of agreement upon principles (or well-supported hypotheses at least) as to the desirable attitude of women toward family life, and necessary limitations imposed by family life.

8. *The "college woman."* — Only within recent years have women in large numbers sought a college education. Now they seem likely to exceed the number of men in liberal-arts courses. The relation of a "liberal-arts education," leading to the degree of A.B., Ph.B., LL.B., or non-technical B.S., to prospective vocations, is yet a matter of uncertainty to the public and, it would also seem, to college professors. No one can pretend that a general college course is vocational in any definite sense, except possibly for some departmental work in high-school teaching — and that is the case not so much because any college prepares for that work as because high-school teaching itself is not yet, in America, based upon professional standards.

Nevertheless, the colleges generally do not make the actual functions of a college education clear to their students or to the public. College professors, in debates and articles, defend affirmative answers to the question, "Does a college education pay?" without distinguishing sharply between the "paying" which is essentially financial and the outcome of successful participation in vocations, and those other kinds of "paying" which are the effect of enrichment in personal culture, enhanced values in citizenship, greater control of health, and the like.

It will prove, of course, very hard to ascertain whether a college education ever or generally pays in the first sense. College students, and, still more, college graduates, represent of course the picked personalities of the time and regions to which they belong. Only persons of superior heredity, superior rearing, and superior lower education, in

general, go to college. Success (as commonly esteemed) in vocational, as well as in other activities, is, in general, assured for these superior persons. Whether a general college education adds to prospects for success in a vocation is clearly not certain, notwithstanding the blind devotion of many college professors to the magic of "mental discipline." That a college education "pays" through enrichment of personal culture and general social or civic usefulness is probable, otherwise the "liberal-arts courses" lose all excuse for being.

Now the situation confronting women graduating from general college courses is difficult. They are naturally superior persons. They are not generally committed to opportunities for homemaking careers. They want to be self-supporting. They dislike to enter upon "unskilled work." Their mature abilities and, as they often think, their education qualify them for something better. What are the possibilities? Their brothers used to feel the same ambition to begin high up the ladder of earning and responsibility; but now the men usually know enough either to go to a vocational (professional) school after leaving college or else begin at the bottom of the ladder on a railroad, in a broker's office, or even on a farm. But there are few vocational schools open to these women; their mothers frequently oppose their beginning at "the bottom" of any ladder. What can they do? Trifle away time entertaining and being entertained, awaiting the expected "engagement" to enter upon the vocation of homemaking? Confessedly, present conditions present here more unsolved than solved problems.

9. *Effects of mechanization and regimentation.* — Current tendencies toward the mechanization of industrial processes and the regimentation of workers are strong. It is the writer's conviction that further evolution of these tendencies is inevitable. Already it is clear that mechanization of work

and subdivision of process greatly increase the variety and range of opportunities open to unskilled and immature girls —they can readily become "tenders" of even complicated machines. It is probable that "machine-tending" will spread. Harvesting, tillage, even milking and ditch-digging, are now done in part by easily managed machines. Could not women drive street cars, electric locomotives, traction-drawn plows, automatic fodder-grinders, as well as adding-machines, looms, tool-grinders, power-driven sewing machines? Machinery makes a given quantity of productive work easier, and more or less interesting and stimulating. There are as yet many unsolved problems here, and they are for the moment at least of even more concern to women than to men, because women more readily than men fall victims in the numerous pathological situations incident to, if not even in some cases inherent in, "modern" industrialism.

10. *General education.* — In all the more progressive American states all girls (as well as boys) are required to attend full-time day schools of general education between the ages of six and fourteen. A constantly increasing proportion of young persons from the more prosperous families attend, in addition, high schools (whose primary purposes are also found in the field of general, as distinguished from vocational, education) for one or more years, while the ambitious daughters of the very prosperous go also to college.

The objectives actually realized through this general education (or, in its higher stages, better named, "liberal" education) have not yet been definitely ascertained or described, especially in the upper grades and liberal-arts colleges. In the minds of many persons these objectives include some having relation to vocational fitness. It is obvious, of course, that a person unable to read or write is automatically debarred thereby from many non-manual vocations. But it is not so clear that a general high-school

education is essential to the pursuit of higher vocations, public opinion to the contrary notwithstanding. The fact that girls or boys graduating from high school are, on the whole, a " selected " group (as regards native abilities, good early nurture, effective character formation in the home, etc.), and, therefore, likely to succeed well in vocational pursuits which they undertake and to give satisfaction to their employers, has, owing to the prevalent habit of reasoning easily *post hoc ergo propter hoc,* caused employers and even parents to associate success with the high-school education itself — as cause and effect.

But, as an accompaniment of the development of more definite plans for direct vocational education, it is becoming increasingly evident that general or liberal education has, and can have, little positive relationship to vocational competency. The primary objectives of effective general education are to be found in personal culture, civic and moral strength, and physical well-being, as these constitute desirable assets among men and women quite irrespective of vocation. The quality of the physical, social (civic and moral), and cultural education now given in upper grades, high schools, and colleges leaves much to be desired, perhaps in largest degree as it affects girls and women. Much of it rests on psychological assumptions that are largely wrong. Its specific objectives have been determined in hard-and-fast form frequently by authorities (like committees on college admission) who have very slight knowledge of the actual qualities, powers, and capacities of those for whom they are prescribing, and even less of accurate knowledge of the social conditions to which these young women should be adjusted for later life and in which they can render valuable service. Nevertheless, some important advances have been made in recent years and greater ones are in prospect in proportion as education becomes more scientific as regards its aims and methods.

But it is now rather clear that vocational education and comprehensive general education cannot effectively be carried on side by side. The one tends to exclude the other or rather to take a primary place in the interests and the attention of the learner. Up to fifteen or seventeen or nineteen or twenty-one years of age, according to strength of intellectual interests, family economic circumstances, and social incentives generally, youths can be led easily to give primary attention to "growth," development, and training toward the non-vocational activities of life. As incidental and secondary to this liberal education they can readily be induced to "work for wages" after school hours and during vacations, to read about "careers," and even to study trigonometry, business English, or other subjects of a demonstrably "prevocational" character for ascertained vocations.

When, on the other hand, the time comes — in the case of a few at fourteen, for many at sixteen and at eighteen, and for the exceptional at twenty or twenty-two — for the youth to enter upon a vocation, or upon specific and demonstrably functioning training therefor, as a result of the interplay of his own instinctive development with the pressure of social forces upon him, then he tends, in response to a very real natural incentive as well as wise customs pressing upon him from society, to give to his vocation the lion's share of his interest and effort. None of us could well wish it otherwise. But there is one course which should be followed in the case of the young person concentrating on the earlier stages (as learner or operative) of his vocation; outside the hours — usually the best of the working day — given to that he should be induced, even aided by supplemental training and instruction and by the public provision of suitable means, if necessary, to give his leisure hours to higher rather than to lower physical, civic, and cultural pursuits. If, for example, a girl of sixteen in a clothing factory or in a "power operating" school prepara-

tory thereto is giving fifty-four hours per week to learning or practicing her vocation, then she should be assisted and inspired to devote a reasonable number of her leisure hours — from thirty to fifty per week — to those extravocational activities that will most enrich her life, continue the growth of her personality, and offset the inevitably cramping effects of her vocational pursuits — since all vocations, even those of homemaking, elementary-school teaching, and nursing, have their "cramping" effects no less certainly than dressmaking, cigarette making, spinning, waiting on table, and selling in a department store.

Now the time at which "full-time" general education should or will cease depends upon many conditions. For many girls and boys in our schools intellectual interests seem greatly to have flagged before fifteen years of age. Where the home economic interests are poor, where the father of four or six children is carrying the burden of supporting an expensive family on a workingman's wages, sensitive children at fifteen or sixteen years of age become eager to help carry the family's load. Some of these children become interested in earning money wherewith to purchase commodities and amusements attractive to themselves. In the case of many city boys of good physical development, the instinctive desire to be doing something "heavy" or "useful" with their muscles doubtless often exerts a strong pressure toward "getting to work." Now that it has become customary for a large proportion of girls to become wage workers away from the home, the same social pressures are doubtless felt by them as by the boys. Other considerations also affect entrance upon wage-earning employments. For many trades the age of sixteen is, or rather was formerly, looked upon as a desirable time for beginning apprenticeship. The repellent character of the work offered during the first two years of the usual high-school course for pupils who have no expectations of finishing the course

has the effect of rendering all school work intensely distasteful.

It is to be expected that workers in vocational guidance will ere long have given us some standards to guide us in advising girls when to substitute a vocation or vocational training as the central interest of the working day for the work of the school of "general" or "liberal" education. The naïve assumptions of academic schoolmasters that one "cannot have too much of general education" are, of course, essentially *ex parte* contentions. The vague convictions of these same authorities that pupils will continue to profit materially from further attendance on schools of general learning as long as they attend are probably widely at variance with the facts, at least as schools and courses are now provided for youths from twelve to eighteen years of age. More to be approved, perhaps, at least in urban environments and under sharply competitive industrial conditions, is the contention that the longer pupils remain in school the better prepared they will be, in maturity and physical resisting power at least, to withstand the abnormal strains and other adverse conditions incident to modern industrial employment.

11. *Some conditions affecting vocational education.* — As introductory to discussion of problems of vocational education of women and girls, it is necessary to recognize: (*a*) that the successful pursuit of *any* and *all* vocations requires that the individual should somewhere and somehow have been trained for that pursuit; (*b*) that under historic conditions such training has been the expected by-product (by-education) of actual participation in the earlier and simpler stages of the vocation; and (*c*) that only in recent times and, as yet, under exceptional conditions has it been feasible or desirable to separate *vocational training* for proficiency from *vocational participation* for production.

Furthermore, it must be recognized that the modern de-

mand for specialized vocational education (in schools) arises from these convictions more or less widely held: (*a*) that for many vocations — homemaking, dressmaking, teaching — the conditions and efficacy of apprenticeship have deteriorated greatly in recent years; (*b*) that for many other vocations, especially of modern development — stenography and clerical work generally, salesmanship, and scores of kinds of factory employments — apprenticeship education never has been carried to the point of being more than a crude method of trial-and-error selection, accompanied by the slow and clumsy building of experience; (*c*) that the absence of systematic provision for vocational education works immeasurable harm to individuals, young and old, in permanently holding their productive efficiency below the requirements for a normal standard of living; and (*d*) that society itself is thereby the loser at all points in the elements that make for social wholesomeness and progress.

It has been previously noted that under American conditions the great majority of girls and women do and will in each case continue to follow two widely unlike vocations — a wage-earning vocation from youth to young womanhood, often from sixteen to twenty-four years of age — after which they will follow for life the vocation of homemaking. In some important respects this situation complicates all problems of vocational education for girls and women, although, in the case of commercial and industrial vocations, these complications are only slightly more serious and difficult than others found in the vocational education of boys and men.

The first difficulty usually encountered is that the girl does not take her wage-earning vocation seriously. For her it is merely a means to the earning of money. She hopes and expects not to follow it long. Except as it brings more money she is not greatly interested in promotion. Given the opportunity to take vocational training, she seeks to

shorten the period of such training as much as possible. She remains indifferent to the coöperative help of unions. She develops little of the *esprit de corps* of work. She is easily exploited and the best discipline for dereliction is found in a system of fines.

But the most unsettling difficulty, doubtless, is that her second vocation, homemaking, is one toward which conditions prevent her from moving in anything like a direct way. She must wait the will and pleasure of others. It is often hardly considered dignified openly to anticipate the new career and to prepare for it. As a consequence of the fact that the wage-earning girl has been for several years hardly more than a boarder in her parents' home or the home of others, and has given little serious thought and almost no preparation to the work of homemaking, it happens frequently that she enters upon this work with the naïve cheerfulness and ignorance of a child and lets her domestic happiness drift upon the rocks of incompetency and discord to the great harm of herself and loss to society.

A third difficulty is encountered as respects those professional vocations for which a long term of years is required in preparation. Capable and ambitious women graduates of high school and even college occasionally manifest keen ambitions to become physicians, architects, painters, writers, or teachers in college or normal school. As a rule these callings require from three to five years of expensive professional training, followed by several years of quasi-apprenticeship, during part of which the individual must be supported (at large expense) by her family, and during no part of which can she expect to be entirely self-supporting. Should girls at eighteen or twenty, who will probably marry before they are thirty years of age, be encouraged to enter upon the long road of preparation for these professional careers, taking the time and using the equipment frequently of expensive institutions of training? Would such training

give valuable assets toward homemaking at all in proportion to the outlay made upon it? Many differences of even expert opinion will be found here.

The rapid development of production by means of machinery and the specialization of processes made possible in all highly organized industrial and commercial production have opened endless opportunities for wage-earning work to women and especially to girls of average capacity and moderate training. Endless varieties of productive work are to be found in industrial establishments to-day in which all that is required of the girl is that she shall be an alert machine-tender. Cloth and clothing manufacture, cigarette making, fruit packing, small hardware production, bookbinding, jewelry making, printing, telephony, paper-box making — these are but suggestive examples. Somewhat more skilled are the commercial occupations — clerical and salesmanship — which, by virtue of subdivision and specialization, are being rendered, to a substantial extent, increasingly accessible to half-matured and slightly trained girl workers.

12. *Vocational levels.* — It is often naïvely assumed that specialized economic production offers, or should offer, opportunities for workers generally to rise in their work toward places of greater responsibility and reward in the same way that was true of the handicraft and other unspecialized callings. This vague assumption has been responsible for the tendency to designate so many juvenile callings as "blind-alley" or "dead-end" occupations.

But it is probably much nearer the facts to describe modern specialized callings in factory, store, and large office as consisting of levels largely, if not wholly, unconnected with each other. The work on certain levels is peculiarly suited to the powers of young people, and often to persons of quite mediocre native abilities. On other levels, maturity and perhaps native ability are required, but not necessarily

experience on lower levels in the same establishment. Naturally there are many exceptions to the principle here stated in general terms, but in the making of educational programs it is not now the exceptions but the prevalent conditions which require emphasis, in view of the deep-seated ignorance of many educators now influencing the development of vocational education. It is clearly to the interest of the worker as well as of society that transition from lower to higher levels should be rendered as easy and timely as practicable for each worker when maturity and ability justify it. That is far from being the case at present. Where production is highly organized, all the work of one "level" being confined to one great room or even shop, the best workers of this level are retained as long as possible, and every barrier is interposed to their movement upward — a situation in direct contrast to the "ladder" system of advancement inherent in most phases of a complex or handicraft calling, such as dressmaking, teaching, farm work, and nursing, where increased skill and general competence grow as parts of a more or less unified structure.

Few systematic means have yet been devised toward assisting the worker to prepare for the better-paid levels. Entry upon these is frequently attended by difficulties of the same general character as those encountered in getting employment in the first place. Uncertainty, hardship, initial blundering, the domineering attitudes of foremen and forewomen, all make these transitions extraordinarily painful and hazardous. Vocational training of the right sort is required for young workers in all highly organized industries no less in transition from intermediate or lower stages to higher stages than at the outset.

13. *Vocational training for specialized vocations.* — Most of the wage-earning work upon which girls and women enter is of a highly subdivided and specialized character, and this promises to be increasingly the case. War production

has taken almost wholly the direction of enhanced "quantity production" of "standardized goods" — cartridges, uniforms, canned meats, aëroplane wings, shells, rifle sights, army shirts, and the like.

For the sake of the happiness of the worker herself as well as for the sake of enhanced production and general economic well-being, it is highly desirable that, as preliminary to entry upon productive work in any specialized process, the girl should receive specific and effective vocational training (and, where necessary or desirable, related instruction and social insight) in that process. For many specialized processes a few weeks, or, at most, months, may amply suffice to give this training, providing there be dedicated to it the same full working day, spirit of concentration, and pursuit of specific and definitely conceived ends that are characteristic of the vocational pursuit itself. Of intensive vocational training of this sort, either for first entry upon wage-earning or as a means whereby the worker of some experience can be assisted to advance to higher or better-paid levels, our public vocational schools provide as yet very few examples. Private effort has resulted in some suggestive experiments and examples upon which publicly supported work may be expected hereafter to be based. It requires courage, imagination, and practical insight of kinds not common among educators to undertake the promotion of intensive, "short-course" vocational training for productive specialties, especially when such training obviously involves large use of "productive work" as an educational means, followed by definitely organized "part-time" participation on a wage-earning basis. Some day we shall in this connection realize better than we do now the large possibilities of the "vestibule school" (a type which should not be refused public support solely because the best place for its location is in a building chiefly dedicated to industry or commerce).

14. *Homemaking education.* — Space does not here permit extended discussion of the possibilities of vocational education for homemaking. Widespread attempts are now being made to introduce this vocational education under the name "home economics" into upper grades and high schools. Where girls have had or can be induced to obtain a large amount of practical experience in their own homes, and if the school instruction is definitely correlated with such home experience, the net outcome will be a form of "vocational extension education" which may prove to be somewhat valuable for farmers' daughters and others not leaving the home to work for wages. But for the large majority of girls in our industrial and commercial cities, home economics education given at the ages from twelve to sixteen will probably produce little permanent power of "execution"; but it will, when properly organized, give rise to appreciations of a fairly definite sort, useful as foundations for subsequent training in skill and management.

But effective homemaking education — for the modal American home expecting three to five children, and operated without help of servants — can be given only when "motive" is ripe. If girls of from seventeen to twenty could look forward to acceptable wage-earning careers as household domestics, then the year (or possibly more) just before entry upon that calling would be the best time for definite, practical education for that form of homemaking service. A few girls at sixteen or eighteen years of age — only daughters, or daughters with invalid mothers — can doubtless be found who will be effectually interested in preparing to take charge of the domestic work in their own homes. These two may be expected, in cities or suburban areas, to constitute a sufficient number to justify provision of practical training adapted to their needs.

But as regards the great majority of girls who serve some years as wage-earners apart from the home, it is doubtful

whether active motives for learning homemaking can be counted upon until after several years in the wage-earning career have passed, and the young woman has reason to anticipate the coming of conditions which will enable her to establish a home of her own. The years immediately preceding and immediately following marriage are, in the last analysis, the best for education in homemaking as a vocation. Of course existing social valuations — conventions, prejudices, fashions — are now opposed to programs having such education in view. But social valuations can readily be changed when sufficient leaders of ability see the light and are willing to spread it. There are many social forces now working in America toward the improvement of the home and the elevation of the vocation of homemaking.

CHAPTER XV

THE PRACTICAL ARTS IN GENERAL EDUCATION[1]

I

INTRODUCTION

Manual Training and Household Arts, when first proposed as subjects of study and practice for upper grades and high schools, were believed by many to offer the only available means of giving in schools what was some years ago vaguely conceived as vocational training — "education through doing," "tool experience," "tool sense," "technical knowledge," as it has been variously called. For many years commercial courses have been offered in high schools (and some commercial studies in the grades) with the avowed intention of assisting pupils towards wage-earning callings. Many persons still believe that household arts for girls, and agriculture for boys, as these subjects can be presented to pupils of ages ranging from twelve to sixteen who are carrying in addition regular programs of academic studies, can make important contributions towards vocational efficiency.

But as one result of over a decade of intense interest in vocational competency as a distinctive end of one form of school education — culminating in the passage of legislation providing national aid for industrial, homemaking, and agricultural vocational education of less than college grade — we now see that little of importance for vocational ends can

[1] This chapter, in substantially its present form, was first published in the Teachers College Record for January and March of 1918.

be accomplished through the manual training, general commercial courses, gardening and agriculture, and household arts as these are found incorporated into customary academic curricula. Most students of educational values are now forced to the conclusion that vocational education in schools can be profitable only when the student, whether at fifteen years of age or at twenty, having completed existing requirements of compulsory school attendance, and having, in addition, given so much time to secondary and higher academic studies as he desires, is ready for the time being to give to the mastery of a vocation substantially as much time and concentrated energy as he would give to it if working for wages or under conditions of apprenticeship. It is also agreed that for the sake of effectiveness conditions should be such that a large proportion — perhaps not less than half — of the student's time available for vocational education can be given to the actual practice of its processes, even as these are carried on in commercially productive shops, offices, homes, farms, and salesrooms — and, ideally, so organized as to give him a wage or other financial return representing compensation for at least a part of his productive effort.

Having reached the conclusion that the practical arts (to use a collective term for all the four chief forms) have little bearing on vocational education, it remains for educators to analyze more clearly than has heretofore been done their educational values for all that non-vocational education which we call " general " or " liberal." That such values are to be found in an especially important measure for urban children, few educators would now dispute; but there exists as yet no satisfactory analysis of the reasons why we may expect to find these values, nor of the probable character of the detailed means and methods of instruction by which they are to be realized.

II

SOCIOLOGICAL AND PEDAGOGICAL BACKGROUNDS

The Sociological Situation out of which has developed modern demands for practical arts education in schools, as well as various historical attempts to explain and meet these demands, may be summarized as follows:

1. In primitive societies everywhere, men and women as means of self-support, protection, and diversion, develop a large number and variety of utilitarian or practical *arts,* the knowledge and skill required in which have been transmitted from generation to generation by social imitation in various forms. Capturing animals on land, water, and in air; fighting hostile peoples; building defenses against men, animals, and weather; preserving foods; working wood, stone, and metals; tanning skins; making baskets, textiles, and other fabrics; brewing; tilling the soil; carving and otherwise decorating stone and wood; domesticating animals; healing the sick; recording and transmitting knowledge; enforcing customs; traveling; interpreting auguries — these and scores of other arts, slowly evolved, become part of the social inheritance.

Even to-day where conditions of life are simple, we find centering in the family group many scores of practical arts. On a remote farm, we find: tillage of soil; training of horses; building of walls, fences, dwellings; preserving foods by drying, salting, and canning; baking of bread; cooking of meats and vegetables; the making of various articles of clothing; digging of wells, drains, and ditches; the making of roads; shoeing of horses; burning charcoal; butchering; packing of ensilage; making cheese and butter; breeding of animals; keeping of books; educating children, etc. Similar lists could be made where the environments are those respectively of the woodsman, fisherman, small shop keeper, gypsy, and home craftsman.

In these primitive homes, ancient or contemporary, the children early become participants in the economic processes. On the average small farm children from five years of age onward are in a measure producers of useful service. They guard animals, run errands, help to "clean up," weed gardens, fetch water and wood, and in many other ways contribute to the economic maintenance of the home and farm establishment. In part, this service is rendered in response to instinctive desires to imitate the activities of elder workers; in part, to win the grateful approval of the older persons assisted; in part, more or less unwillingly, as tasks imposed and uncompensated; and occasionally, for money or other material reward.

This participation during childhood and youth in the practical arts activities of the home, shop, farm, fishing boat, and other simple economic agencies was doubtless universal until quite recently; and is still practicable in some degree for perhaps ninety per cent of all girls, and over fifty per cent of all boys in the United States. But it is clear to every observer that opportunities for it are everywhere diminishing. The suburban home gives to the boys of six to sixteen years of age only rare and meager opportunities to share in productive work of any sort; and practically none at all to work with older youths or men, especially those like father, brothers, and "hired help" who would be sympathetic and coöperative. In the case of girls, the suburban home still affords some opportunities for helpfulness, where most of the service is not delegated to servants; but even there, we find that many of the practical arts have been specialized away from the home. Baking, laundering, dressmaking, and gardening survive in urban communities only in vestigial forms.

On more progressive farms, boys are given less to do and assist their elders less frequently than formerly. "Boys" cannot be trusted to drive good horses, milk good

cows, manipulate costly and perhaps dangerous machinery, construct well-finished fences, drains, and wells, convey to market carefully packed products, repair well-kept harness, or otherwise share in the elaborated and technical processes characteristic of good modern farming. Specialized work, soon becoming drudgery, there is, of course, in abundance; but the art, skill, talent, and even inventive genius involved in its organization and mechanisms are commonly specialized far away from the ken of the boy. Such work, too, takes little hold on imitative instincts, and does not round into particular projects or achievements which make so decided an appeal to growing youth.

Because the home, the working environment of the growing girl, is usually less developed and specialized than the industrial, agricultural, commercial, and professional fields in which men and boys work, girls both in city and in rural homes still become participants in many of the practical arts. When it is remembered that servants are found in perhaps fewer than ten per cent of the homes of America; that the average family money income in perhaps ninety per cent of these homes is under $1,500 per year; and that the functions of the wife and mother must always involve a large amount of preparation of food, repair of clothing, nursing of children, cleaning of floors, dishes, and garments, making of beds, and caring for the sick, it is evident that, outside of school hours, the large majority of American girls still live in an atmosphere of productive work, where participation is natural, easily effected on a "short unit" basis, and open to all the incentives of attraction and compulsion normally required for the gradual induction of young people into the useful activities of the world.

2. **Withdrawal of Practical Arts from Homes.** — So long as social evolution continues in directions now established, children will share less and less in the economic activities of their parents. Several contributing causes for this are

found. The first is that economic activities, except as regards homemaking, simple farming, primitive fishing, and very small merchandising, are now no longer carried on in the immediate home environment. In the professions, railroading, large merchandising, and other forms of business, almost all forms of manufacturing, and in well-developed agriculture and fisheries, it is customary for the chief workers in the family other than the homemaker to "go to work" at early hours, and often for periods of several days. From the standpoint of the growing children, this "going to work" of their elders means transition to remote places and behind forbidding walls whither childish imaginations can hardly follow, and whence, of course, come no incentives for childish participation in the work of the "big people."

But this centralization of productive industry has its causes in the fact that, in a sense, the "practical arts" have ceased to be, having been replaced by those systematized forms of production which constitute modern "business," "manufacture," "transportation," "professional enterprise," etc. In all these fields, we are in the presence of applied science, use of natural forces, organized and specialized effort and employment of fixed and mobile capital in proportions that are large in comparison with the labor involved. We can hardly doubt that the processes which have made it possible for modern industry, by means of harnessed forces and organization, to multiply the productiveness of a unit of human effort and thus make it possible for constantly larger populations with rising standards of living to live on given areas, will continue. We may reasonably expect the small "mixed" farm, the little workshop attached to the home, the primitive fishing equipment, and merchandising establishment "in front" or "below" the residence, to disappear, and with them the educational advantages which childish participation as co-workers in these centers of labor afforded.

3. **Practical Arts for Development.** — Have these educational advantages been important? It is this inquiry which gives significance to past and present attempts to establish "practical arts" as courses in schools. Perhaps the best analogy for the problem here suggested will be found in the evolution of educational opinion regarding the place of physical play in development. The natural disposition towards physical play, so instinctive during childhood, has usually found abundant opportunities for space, implement, and social incentive in the simple and staple environment of our ancestors. Little importance was customarily attached to physical play — it was often regarded as one of the natural "weeds" of life, to be disposed of as soon as occasion and means of enforcing the serious thought and work of life could be provided.

But the growth of urban environments, the migration of peoples, and, at one stage, the premature forcing of children into routine labor, by impairing opportunities for physical play, revealed its importance and necessity in the development of the child. To-day the best opinion generally holds that abundant physical play during the plastic years of infancy, childhood, and youth is desirable for all forms of growth, and indispensable to the best and highest forms of that growth — physical, moral, æsthetic, intellectual. The biological reasons for this are, to a large extent, obscure, but the biological situation involved is not. Whatever the original causes, nature has undoubtedly provided that an important part of the child's physical (and mental and social) development is to be achieved through the activities constituting play. Withholding opportunities and incentives for such play probably always results in a dwarfing of the child's development. Consequently, when circumstances of restricted material environment or isolation operate to prevent play activities, society, represented by the city, the village, the church, the family, and other groupings is now

seeking purposefully to provide favorable play facilities and incentives. Hence the modern play movement, regarded by social economists as one of the most important means of offsetting the deteriorating effects of highly artificial environments wherein children must be reared.

Now it is inherently probable that if we possessed adequate knowledge of child development, of the physical, psychical, and social processes by which the plastic infant becomes the matured man or woman, we should find that early participation in practical arts activities constitutes, like physical play, as narrowly defined, also a highly desirable means to normal development and, perhaps, an indispensable means to the highest forms of that development. We should expect this to be so because of the many thousands of years of man's evolution during which children early began participation in the economic activities which always claimed so large a part of the attention of the adult members of the family group. For countless centuries, so far as we know, children matured in economic power through the apprenticeship of the family group — through that instinctive early sharing in useful work which at first closely allied itself to the play life, and only imperceptibly passed under the yoke of sustained purpose and rigidly held routine.

Probably then, all forms of childish participation in the practical arts of the simple home, workshop, trading place, farm, mine, and fishing station have been important, even indispensable elements in the making of men and women. If so, when conditions arise that shut children away from opportunities for such participation, society will find it necessary by some means to supply the missing opportunities for growth or development.

4. **Practical Arts Courses** in some form have been gradually finding a place in schools for upwards of a hundred years. Schools for orphans and delinquents, attempting to supply all the developmental means of the home, carried

over needlework, choring, gardening, and other useful work. In some countries, training in needlework for girls was long ago delegated to the schools as naturally as training in penmanship. The demands voiced by Pestalozzi and his followers for "object teaching," while only remotely related to practical arts, did represent a tendency in educational thought towards greater concreteness and less bookishness in school work.

Wherever sympathetic educators have brought city boys or girls — or others deprived of opportunities for participation in home work — into shops equipped with tools (including those appropriate to the household arts), they have almost instantly perceived in the avidity with which these young people entered upon constructive activities, manifestations of needs for expression of workmanship instincts that are deep-seated, and that probably have a close relationship to all forms of fundamental development — moral and mental no less than physical, social and cultural no less than vocational.

For a number of reasons, the evolution of practical arts as school subjects has taken place most rapidly in cities. Progressive movements in education usually start in cities, philanthropy frequently leading the way. Educational resources wherewith to procure equipment are commonly found most readily in prosperous and generous centers of population. Urban segregation of peoples along economic and other lines brings into relief in masses those most in need of specialized or extended educational treatment. In the case of practical arts the deprivations of an artificial environment are first clearly seen in cities. Furthermore, in cities where industries gather, appear greatest needs for vocational education, which, in the estimation (probably mistaken) of many people heretofore, could best be met through practical arts instruction.

It has been natural, therefore, that in the processes of ex-

tending and enriching school education during the last half century, we should have seen many and varied attempts to incorporate practical arts in some form adapted to children into school curricula all the way from the kindergarten to the senior year of the high school.

5. **Historic Experiments.** — We need not here recount the history of constructive work or handwork in the kindergarten and lower grades; of manual training or sloyd for upper grade boys; of "mechanic arts" in special high schools for boys; of sewing and cooking for girls of upper grades, or "home economics" for those in high schools; or of gardening or agriculture in rural or village schools. All of these have been interesting and suggestive developments, and each has contributed something to our present stock of educational ideas.

But it is necessary here to review the aims which seem to have controlled the introduction and development of these practical activities, even where now we perceive that these aims were grounded in a very mystical and uncertain pedagogy, since, in large measure, we have yet to discover satisfactory foundations, demonstrable or hypothetical, for practical arts teaching.

Certainly we can regard with much respect the objectives long held, more or less clearly, on behalf of practical activities in classes for younger children — namely, to give opportunities for expression, to give concreteness and realism to school work, and, more recently, to provide vital centers of correlation for the more abstract school subjects. But we now see that, however sound the vague pedagogical theories here involved, commonly the very fragmentary and often very formal exercises in handwork developed constituted at best a frail basis for the activities and correlations desired; nor has subsequent experience improved the situation greatly except in work for children under ten years of age.

The Disciplinary Theory. — More open to criticism has been the "disciplinary" theory which even yet controls heavily — without now being admitted as such — in manual training for upper grades and high schools. The very words "manual training" reflect the prominence of this theory, the implications being that through some definite exercises with tools the "hand" can be trained for a large variety of the useful works of life. Of course, the "hand" can be trained, and in hundreds of ways — to write with a pen, to pitch a baseball curve, to handle a dentist's forceps, to discern by touch the quality of cloth, to thread a needle, to button a jacket, to turn a screwdriver, to drive a hammer, to deliver the blow of the pugilist, to roll a cigarette, to play the violin, or to manipulate the typewriter. But we now see that each of these forms of skill is specific and individual, and probably almost wholly unrelated to any other. We can certainly train the hand — but only by deciding first for what particular form of skill or power we wish to train it, and then moving directly towards that. We should like to believe that much training in tying knots or whittling will lay foundations for other forms of manual skill to be acquired later. If the girl with hand trained for rapid action on piano keys could learn typewriting with greater facility than her sister who has had no piano practice, we could find ways for reducing the time and effort required to learn many vocational arts; but there is no evidence that we can thus utilize some of the effects of one "skill" in other and, what seem to be only when superficially considered, related fields.

We are forced thus to the conviction that there is little foundation for what is commonly held as the "disciplinary" theory in education — that some specific forms of training in mental or physical skill or in moral habit will "transfer" or "spread," and thus give foundations for powers to be employed later. We shall have to relegate this theory to the limbo wherein are to be found shelved the "panaceas" or

curative "simples," the "philosophers' stones," the "fountains of youth," the philosophers' ultimate formulæ and primordial substances, and all the other more or less mystical or magic simples wherewith humanity, aspiring towards the light, has tried to project its understanding beyond the bounds of tested experience.

Probably laymen more than educators have imputed to practical arts in the schools significant values for vocational education, although at times educators have not been slow to take advantage of public credulity in this respect to obtain additional funds for school work. Indeed, under the influence of the disciplinary theory referred to above, it has always, of course, been easily possible to infer that any value arising from handwork could and would function in vocational competency.

The situation here involved is by no means simple, partly because in certain fields of productive work like the home and the small farm, the activities there carried on are still often primitive and in reality practical arts, and capable, therefore, of being in a measure related to the practical arts possible in the schools. On the other hand, in the fields of professional, industrial, nautical, commercial, and military activities, where specialization has gone far, and the simple character of the primitive practical arts has almost completely disappeared, it is doubtful if any important intimate connections have ever been established between the practical arts work that has been done by pupils under sixteen years of age and the vocational pursuits carried on in the world of productive work. But it has been easy for parents and others interested in vocational training to be deluded by the practical appearance of the shops and laboratories devoted to practical arts work. In some cases, notably in bookkeeping and typewriting, where social striving for more attractive fields of employment made it practically certain that most of the pupils electing these subjects would eventu-

ally go into commercial occupations, whether their school training were good or bad as vocational preparation, even the pupils themselves have, after completing their work, continued to be deceived by its specious resemblance to real vocational education.

The final evolution in a number of states of a definite demand for special public schools that shall offer genuine vocational education (culminating in the Smith-Hughes act extending national aid for the support of such education) has tended to clear up the previously confused situation as regards the relation of practical arts to vocational education. It is now recognized by careful thinkers among educators that manual training in its various varieties can contribute practically nothing to vocational competency; that however valuable the general household arts work may be for general education, it contributes but little of substance to direct preparation for homemaking; that textbook and laboratory courses in agriculture are remote from the vocational efficiency demanded for farming, while home gardening may have only slightly greater significance; and that the commercial courses of our schools are now not quite fish and not quite fowl, and will have to be so divided that definite vocational training can be provided for those who have already elected a vocation while for others the bookkeeping, typewriting, etc., can be made to function as elements in general education.

Vocational Guidance. — Finally are to be noted the widespread attempts during the last two or three years to justify several forms of practical arts instruction on grounds of their contributions to vocation finding or guidance. We must recognize the importance of providing at as early a stage as practicable for such experiences as will enable youths to ascertain, both negatively and positively, their probable vocational powers and interests. If by some form of practical arts teaching such guidance could in substantial

measure be given, we might well afford to sacrifice to this end some other objectives possible to these subjects.

But the present writer is of the opinion that such guidance, through practical arts, is only feasible in slight measure and can be effective with only a small proportion of youths twelve to sixteen years of age. The chief difficulty is that of representing in any school shop the realities of commercial production — its demands for commercially valuable qualities and quantities of work, and for the social atmosphere of work. At best the school devoted to general education can introduce within its walls only quite amateurish and often very unreal elements of vocational life — as witness the cabinet-making, the gardening, the bookkeeping, and the cooking and sewing of junior and senior high schools.

No less serious an obstacle is the difficulty of actually representing in any school the numerous special lines of productive work found in any industrial or commercial community. If we note the long list of local occupations reported by the United States Census for such a commercial city as Rochester, New York, we can readily infer the impracticability of giving all, or any important proportion of them, representative treatment in school shops.[1]

[1] Males and females in selected wage-earning occupations in Rochester, N. Y.:

(Males) Fruit growers and nurserymen; garden laborers, gardeners, orchard and nursery laborers; apprentices (in manufacturing and mechanical industries); bakers; blacksmiths; brick and stone masons; buffers and polishers (metal); builders and building contractors; cabinet makers; carpenters; compositors, linotypers, and typesetters; electricians and electrical engineers; engineers (stationary); firemen (except locomotive and fire department); foremen and overseers (manufacturing); laborers (in mechanical and manufacturing industries); helpers in building and hand trades; lithographers; machinists and millwrights; managers and superintendents (manufacturing); manufacturers and officials; molders, founders, and casters (iron); painters, glaziers, and varnishers (building); painters, glaziers, and varnishers (factory); plumbers and gas and steam fitters; semi-skilled operatives in furniture, piano, and organ factories; semi-skilled operatives in printing and publishing; semi-skilled operatives in shoe factories; semi-

It will be contended that while most commercial production is greatly specialized, a few type materials, machines, and even processes, can be selected which will serve to interpret them all. This is an attractive theory and deserves careful testing against the facts of experience. It seems to savor somewhat of the mysticisms behind which the educator, as did once the physician, still conceals his ignorance of realities.

Doubtless, through any well-devised and very flexible plan of practical arts instruction, a small number of pupils will discover positive and negative interests — attractions and repulsions — which will have some bearing on the vocation finally selected. Perhaps five per cent of the boys sampling wood-working, electrical working, printing, gardening, and house repair will find among these their vocations — while another five per cent will find that for these lines of work they distinctly do not have ability or liking. Such contri-

skilled operatives in suit, coat, cloak, and overall factories; sewers and sewing machine operators; shoemakers and cobblers; tailors; tinsmiths; chauffeurs; conductors (street railroad); draymen, teamsters, and expressmen; laborers (road and street building and repairing); laborers (steam railroad); locomotive engineers; motormen; clerks in stores; commercial travelers; deliverymen; insurance agents and officials; laborers, porters, and helpers in stores; real estate agents and officials; retail dealers; salesmen (stores); firemen; guards, watchmen, and doorkeepers; laborers (public service); policemen; clergymen; draftsmen; lawyers, judges, and justices; musicians and teachers of music; physicians and surgeons; barbers, hairdressers, and manicurists; bartenders; janitors and sextons; porters; saloon keepers; servants; waiters; agents and canvassers; bookkeepers, cashiers, and accountants; clerks; collectors; messenger, bundle, and office boys.

(Females) Dressmakers and seamstresses; forewomen and overseers (manufacturing); milliners and millinery dealers; semi-skilled operatives in button factories; semi-skilled operatives in printing and publishing; semi-skilled operatives in shoe factories; sewers and sewing machine operators (factory); tailoresses; telephone operators; clerks in stores; retail dealers; saleswomen (stores); musicians and teachers of music; teachers (school); trained nurses; boarding and lodging housekeepers; housekeepers and stewardesses; laundresses (not in laundry); laundry operatives; midwives and nurses (not trained); servants; waitresses; bookkeepers, cashiers, and accountants; clerks; stenographers and typewriters.

butions to vocation finding will be acceptable when incidental to the pursuit of more general and substantial objectives, but, surely, they would in themselves constitute no justification for giving practical arts subjects a prominent place in school curricula.

6. **Summary.** — It would seem, then, that we have, as a result of nearly a century's interest in practical arts instruction in schools (to say nothing of the pioneering efforts of innovators like Comenius, Pestalozzi, and others) reached the following conclusions:

(*a*) For children otherwise deprived of "natural" opportunities for early and gradual induction into productive activities, the need is great that schools shall provide such opportunities as part of their offerings towards general development, general training, and general instruction.

(*b*) But it is now rarely practicable, even if it were important, to secure vocational competency through the means and methods of practical arts participation, because of changes in most fields of economic production.

(*c*) Neither is it practicable to hold as primary objectives of practical arts education such ends as self-expression, hand training, vocation finding, or provision of centers of correlation for instruction in other types of subject matter, except, possibly, in the lowest grades.

(*d*) The final justification for the provision of abundant opportunities for practical arts participation in schools is to be found in the contributions such amateur participation makes to general development, in ways analogous to the contributions of physical play.

7. But if general development, especially for youths from twelve to sixteen years of age, be held as the primary objective of practical arts education, then fundamental revisions of currently accepted traditions as to means and methods are essential. As preliminary to a discussion of these, agreement should be had as to use of terms.

III

PROPOSED DEFINITIONS AND DISTINCTIONS

As a basis for constructive work in proposing educational policies, and in evolving practicable administrative plans, the following are suggested as useful definitions and distinctions in the effort to determine desirable and feasible objectives for practical arts education in schools:

1. All kinds of instruction, training, and fostered development, provided through schools, may be classified as (*a*) general (common, liberal, or non-vocational) education and (*b*) vocational education.

2. Vocational education includes only those educational objectives that are determined by the requirements of specific vocations; and, because the vocational activities of men are greatly differentiated, these requirements are distinctive according to the specific vocation for which preparation is being made. As a corollary, there can be no "general" vocational education.

3. General education includes all objectives determined by the requirements of common citizenship, common culture, and general development of important powers and capacities in selected individuals, irrespective of future occupation.

4. In the case of each body of "subject matter" of instruction, type of training, or species of fostered development of inherent powers and capacities, it is obvious that effective practice requires that there should at all times be a "primary" or controlling objective, towards which all other possible objectives must be regarded as secondary or incidental and, therefore, as not controlling of means and methods of education. It follows that means and practices in schools designed to function as general education cannot be expected to yield more than incidental value to the proper ends of vocational education; and vice versa.

5. It is clearly possible to teach in schools an almost endless variety of practical processes and technical knowledge as these are characteristic of the economically productive occupations (productive of first-hand or exchangeable economic utilities) in which men and women engage or have in the past engaged. But such teaching may have, in any given case, as its controlling objective, to prepare the youth for effective participation in a vocational sense in the occupation upon which the specific teaching is based; or, quite otherwise, the objective may be simply to provide for the acquisition of general experience, for participation in wholesome activity of a non-vocational (possibly amateur) character, and for the development of interests, appreciations, and tastes as are stimulated by such activity. The first is properly a vocational objective; the second, no less certainly, a general or liberal objective. There is no satisfactory evidence that, except in the case of rare individuals, both can be ministered to by the same form of school practice, method, or spirit of work.

6. Hence the proposal that all use in schools of practical activities and immediately related knowledge based upon the occupations of men shall, when directed towards producing specific vocational competency, be designated as vocational education; and when used as elements or phases of general education, as practical arts.

7. The proposals and recommendations made in this paper are based upon the following hypotheses as to desirable and profitable educational aims:

a. The objectives or purposes of all education[1] fall roughly into two classes according as the controlling purpose

[1] The word "education" is here used to include all forms of development, instruction, and training for which conscious provision is or can be made by society. It includes the direct education of the schools, and also the by-education of shop, home, church, press, police power, street and playground, etc., in so far as these naturally provide or can be designed to provide examples for imitation, suggestions, openings, opportunities, and incentives for developmental play, and other activities.

in any case is: (*a*) the facilitating and furthering of the normal development of the child along lines largely natural, instinctive, spontaneous (herein called *beta* types of learning), or (*b*) so training and instructing the child that he shall possess later, and especially in manhood, certain specific powers and capacities deemed of importance in civilized life (herein called *alpha* types of learning).

(1) Illustrations. Under the first head we should place: all ordinary physical play and those games to which children readily take on basis of imitation; all ordinary powers of running, walking, climbing, creeping, swimming (when learned young), conversing in the vernacular, singing, dancing, sharing in everyday occupations; the acquisition of knowledge from story, natural contact with environment, naïve experimentation, childish participation in vocations; all eager participation in physical, social, or intellectual activities when once systematic training has removed mechanical difficulties, as fiction reading, social dancing, card playing, travel, theater attendance, tennis, letter writing (for a few), amateur gardening, musical execution, craftsmanship, and the acquisition of a vocation by "picking it up."

(2) Under the second head we would include all those forms of direct and positive education having as ends: to read, write, and spell in the vernacular; to read or speak a foreign language (as involving others than children under five); to read musical notation; to play an instrument; to meet well the requirements of a vocation; to know with some degree of accuracy as well as ability to recall and use, the facts and relations presented in specified areas of history, science, geography; to be able to execute with some degree of precision work in drawing, writing, calculation, construction, and other fields in which, qualitatively or quantitatively, the powers sought represent the exactions of civilization upon the "natural" man.

b. In the early stages of their evolution, it has not been

the function of the schools, as specialized agencies of education, to provide for the "beta" types of learning described above. It was expected that, in the limited time and with the limited means at their disposal, the schools should devote their efforts exclusively to the alpha types, thus leaving to the home and other non-school agencies responsibility for providing the opportunities for development described above as beta types of learning.

c. Under modern conditions, and more particularly in urban or other communities where non-school facilities for natural or "beta" types of learning are deficient or otherwise ineffective, society progressively delegates to the school responsibility for promoting these types. In large measure, this explains: the use of the kindergarten, especially in cities; promotion under the auspices of the school of playgrounds, games, athletics, and physical play generally; the development in schools of libraries, story telling, musical and art exhibitions, and other means of promoting natural satisfaction of intellectual interests; and the promotion of the social (*i.e.* sociability) sides of school life.

d. Any education designed directly and purposefully to fit for vocation clearly belongs in the alpha category. It is doubtful if any serious attempt to provide in schools for vocational by-education would be profitable, although doubtless some important by-education towards vocation results from the purposive pursuit of educational ends properly to be described as cultural and social (or, together, liberal).

e. On the other hand, it is highly probable that, for all young persons and especially during the transitional years from the age of twelve to sixteen, or even eighteen, a large amount of participation in practical activities related to and suggested by the vocational activities of men and women will make contributions to development — physical, social, cultural, perhaps, remotely, vocational — analogous in im-

portance and general character to those made by physical play. But contributions to education through such participation in practical activities clearly belong to the beta class of educational ends, given above. If provided for in, or under the auspices of, schools, it is doubtful if they should ever be required to partake of the specific and determinate character of the alpha type of learning, especially since final results are to be found simply in the general development of the individual and not in specific powers and capacities required in civilized society. In so far as specific forms of manual skill are required in vocations — except handwriting — these must be acquired through direct vocational education.

f. As in the case of kindergarten activities, provision for play under the direction of the school, nature study, story-telling, chorus singing, library reading, and other forms of beta education, it becomes the duty of society (to itself as well as to its individual members) in any given locality or situation to provide for practical arts participation only when either (*a*) the non-school agencies become less able than formerly to provide for it; or (*b*) because of changed conditions, there arises a greater need than existed formerly for this form of assisted development. If we assume the normal social environment under which boys and girls have been reared for thousands of years, usually to have included abundant opportunity for early participation as little helpers, assistants, amateur workers in the easier phases of the vocational activities of their elders, then it may easily follow that, under modern economic conditions, the need that practical arts be developed in or through schools arises for the reasons given under (*a*) above.

g. It can readily be shown that opportunities are denied the children of many communities to-day to participate in the easier stages of the vocational activities of their elders. Probably the desirable development of these children can be

effected only by the provision through the schools of opportunities for the participation in practical arts activities which their environment denies them.

h. For convenience we may classify practical arts subjects suited to schools and especially for youths from twelve to sixteen as follows:

(1) Agricultural arts: home gardening; tree planting and nursing; poultry raising; food packing; "corn club" work; pig clubs; milking; butter and cheese making; fruit drying; farm product marketing; farm mechanics; etc.

(2) Industrial arts: cloth weaving; house repair and building; house painting; installation of screens, drainage, water supply, electric bells, electric lighting, central heating; machine dissection and reassembly (sewing machines, guns, lawn mowers, stoves, pumps, bicycles, motors, optical instruments, vacuum cleaners, washing machines, lathes, etc.); bookbinding; printing; photography; wall papering and decoration; fabrication of playground apparatus; furniture making; tool sharpening; wall building; road construction; boat building; photo-mounting; engraving; mechanical draughting; pottery and glass making; shoe repairing; tailoring and clothing repair; tinsmithing; mining; jewelry making; cigar making; teaming; bread baking; food packing; and scores of other activities based upon building, manufacturing, mining, and transporting industries; etc.

(3) Commercial arts: typewriting; business penmanship, arithmetic, documents, English; display advertising; selling; bookkeeping; package making; comptometer manipulation; filing; banking; telegraphy; dictaphone operation; etc.

(4) Household arts: kitchen cooking; camp cooking; food preserving; food buying; food serving; house planning; toy house construction; home (or room) decoration; furniture choosing, distributing, upkeep; bed-making; repair (or upkeep) of apparatus for plumbing, heating, light-

ing, cleaning, ventilating, screening, cooking, sewing; infant nursing (feeding, cleaning, dressing, exercising); sick nursing; decorative window and yard gardening; clothing buying, making, repairing; accounting; entertaining; participation in festivals; and many others.

(5) Nautical arts: fishing; fish planting; boat making; boat sailing; etc. (a division not yet found in American schools).

IV

PROPOSALS FOR INDUSTRIAL ARTS

The Comprehensive Shop. — The following proposed shop for boys from twelve to fourteen years of age with a tentative program of activities is here described in order to give a measure of concrete exemplification to the pedagogical findings set forth in the present paper.

Let us assume a city junior high school of 1200 pupils, chiefly from twelve to fourteen years of age, which offers to boys three elective courses in practical arts: namely, the "agricultural," the "commercial," and the "industrial." In each of these courses, the amount of time to be given by pupils enrolled will vary from two to ten hours per week, administrative economy requiring that a pupil shall enroll for some definite number of weekly periods. Assume further that experience shows that an average of 300 boys will enroll in the department of industrial arts and that the average weekly attendance will be five hours per pupil.

Let us in addition suppose that for the principal housing of the industrial arts department there is provided one large shop room about sixty feet square, with a mezzanine floor, the whole providing about 5000 feet of floor space. This room is to be lighted, heated, and ventilated in accordance with approved principles of factory construction.

The industries (excluding commerce, agriculture, and homemaking) of the day, and especially those of the region from which the pupils are drawn, are canvassed for activities which will probably appeal to the amateur practical instincts and ideals of boys from twelve to fourteen, and through which they can realize products that will possess some vital significance to them as results of amateur effort. At least one set of the necessary tools or machines will, in each case, be installed. If the character of the work or the implements in any case (such as photography, forge work, gluing, etc.) requires a measure of seclusion or protection, small areas of the large shop might be glassed in for this purpose.

In the light of experience or our knowledge of inherent probabilities, we may assume that equipment for the following purposes would find a place: wood-working tools such as hand and power tools suitable to the making of simple articles of home and school furniture (book-cases, tables, chairs, etc.), playground apparatus, etc.; power and hand sharpeners for knives and other home cutlery, chisels, saws, axes, hoes, etc.; printing press, type, etc.; forge, anvil, and other equipment necessary for making hoes, picks, hinges, and various repair parts; cameras, dark room, etc., for amateur photography; appliances for half-soling and patching shoes; tools and materials for vulcanizing and repairing bicycle tires, tubes, and garden hose; sewing machines and other materials for tailoring and pressing; kit for simple plumbing repair work at home or in school; equipment for installing signal bells and practice instruments for telegraphy, telephony, and wireless; equipment for home and school painting, varnishing, and glazing; tools for bookbinding; appliances for tinsmithing repair, and minor sheet metal construction; equipment for the execution of small construction jobs in concrete; tools for work with decorative metals; and many others. Probably examination of indus-

tries not represented above, *e.g.* mining, textile manufacture, pottery and glass making, food packing, paving, transportation, engine driving and repair, leather working, and the like will reveal many other possible projects meeting the dual requirement of giving a serviceable product, and of being suitable as regards magnitude, safety, and costs for boys, from twelve to fourteen years of age.

As a rule, sufficient equipment for only one worker at a time in one field or department would probably be supplied, except in the case, perhaps, of certain frequently used hand tools.

Project Basis. — Obviously, the industrial arts work would have to be organized on a "project" basis; that is, a pupil or a group of coöperating pupils would be given opportunities to elect definite units of constructive work, each of these having an integral character, each suggesting or demanding appropriate standards of execution, and each leading to a serviceable or enjoyable product. But there should be placed before the learner much more than some meager directions for his project. Ideally, he should have access to several examples of previously executed work on any type of project — executed by former pupils, the teacher, or even procured from commercial channels. To these concrete examples should be added an abundance of printed and illustrated descriptive matter, not merely of projects adapted to youthful capacity, but also of those gigantic projects through which man by his enterprise is changing not only the conditions of human living but the very face of the earth itself.

Under these conditions, our large open work shop would naturally be divided into various small sections, some of them inclosed, and in each of which would be gathered suitable concrete examples of work done, together with printed matter, pictures, etc. A substantial part of the educational value of such a shop would be realized simply through the

opportunities afforded to all pupils to observe tools in use, projects in various stages of completion, pictures of related commercial projects, etc.

It is not here assumed that all the boys of the junior high school would come, or would be admitted, to this industrial arts shop. Attendance should certainly be optional, and no one should be permitted to enter or to remain unless prepared to take the work in a serious amateur spirit and to conform to the necessary disciplinary requirements of the place — which, of course, will be very different from those of a schoolroom, and will probably more nearly resemble those of a well-conducted shop, except that under reasonable restrictions full opportunities should be given to any pupil to observe processes other than those in which he is himself engaged.

It is apparent, too, that no serial arrangement of projects is necessary or desirable. Naturally, the approval of the instructor would be required before a pupil could undertake a given project; and that approval would be withheld if the pupil lacked the strength, skill, or knowledge probably required to execute it in accordance with reasonable amateur standards. It would, of course, be a reasonable requirement that a pupil thus undertaking a project suited to his abilities would be expected to complete it, or else be debarred from the shop.

The working out of the kind of pedagogical plan here contemplated may at first sight seem to require a large amount of teaching service; but this will probably prove unnecessary. It should be expected that each learner will obtain working directions and suggestions chiefly from printed matter, as is now so often the case with boys carrying on projects at home, and for whom, as is well known, a great variety of serviceable books have been prepared. Excellent suggestions for this form of pedagogical approach can be found in the Boy Scout handbooks.

Furthermore, the shop should be self-governing in large measure. No pupil should be present against his will, and no one should remain who cannot readily accept the restrictions which must necessarily obtain. When boys and girls are required to attend school, there is involved, as one condition, compulsory attendance on certain kinds of studies and exercises; but surely the practical arts ought not to suffer from the presence of the reluctant and the ill-disposed, if for no other reason than that the educational values of the subject, both for the interested and the uninterested, will probably then be nullified. If, indeed, it should prove necessary to compel some pupils to take practical arts work for any reason, then the "compelled" ones should be given space apart, and perhaps should be set to work at "disciplinary" manual training—a sort of "awkward squad," "guard duty," or forced labor—if we must use analogies from other fields where the willing must be distinguished from the forced, the orderly from the disorderly.

Where a school is large and rich enough to make a large variety of offerings, it will naturally happen that a given pupil can take but a small portion of these. It is doubtful, too, whether any serious effort should be made to induce the taking of one type of industrial arts project rather than another. If one boy prefers to confine his efforts largely to electrical and other mechanical projects, while another centers his attention for a year on printing and bookbinding, have we any satisfactory reasons for demurring? Again, if a boy wishes to execute just one project in photography, or printing, or shoe repairing, taking his time for perhaps only one month, should we complain? At least, until we have more experience, we shall find it desirable to provide for the largest amount of elasticity which is consistent with administrative limitations.

V

PROPOSALS FOR AGRICULTURAL ARTS

The Home Farm Project. — It is in gardening or agriculture, probably, that the soundest pedagogy of practical arts instruction has thus far been exemplified. School gardening and especially home gardening (including small live-stock raising) extending to the various corn, pig, and canning contests at their best, as directed by city and country schools, exhibit the following valuable features of practical arts instruction: (*a*) The work is not compulsory — only those desiring to undertake projects do so. (*b*) The work is chiefly practical, and when at all well executed results in a valuable product in which the pupil and his friends can take pride. (*c*) The work organizes naturally on a project basis — usually individual, sometimes joint. (*d*) The pupil must rely largely upon his own efforts, assisted by printed directions; no excessive amount of teaching service is required. (*e*) The execution of projects on an amateur basis gives a large fund of very concrete experience, in all probability making important contributions to cultural, physical, moral, and, in a degree, vocational development. (*f*) Each project offers opportunity, in addition to practical work, for a considerable amount of correlated reading, both technical and general.

Experience has shown that home gardening (which is the most effective form of agricultural practical arts) requires, for its general development, the following means: (*a*) For a small state or for a portion of a large one there should be a general director who shall acquaint teachers with possibilities, issue leaflets, supervise contests (these are probably not very necessary, and undoubtedly they develop objectionable features), and in a general way promote public and educational interest in this work. (*b*) In each village

or city school there should be delegated to one teacher of some special ability the time, means, and authority to promote home gardening, provision being made that such special teacher shall continue in active service with his boys (and some girls) through the summer months. (Probably one teacher can supervise the work of upward of 100 pupils.) (*c*) Provision should be made by the school for certain means and incentives such as detailed directions, seeds, exhibitions of products, badges, etc.

Granted these facilities, and in cities the necessary land, there exist at present no reasons why in most American communities, public schools should not offer agricultural practical arts, especially to boys from twelve to fifteen, as an attractive and very profitable elective.

Under rural and village school conditions, it is probable that a considerable number of those taking agricultural arts in general education will eventually enter upon farming, gardening, or stock raising as a vocation; but it seems undesirable that, even where this results, serious efforts should be made to give the instruction and training for youths from twelve to fourteen a vocational bias. The amateur spirit, so well shown in the best home gardening now, and which properly combines the play spirit with interest in adult vocations and productive work, should be preserved. In cities, where this work probably has greater educational value than in the country, it is not to be expected that those taking it will, except in rare instances, find their way into agricultural vocations. When agricultural arts operate towards revealing deep interests and aptitudes (vocational guidance), we may accept the result with gratitude, but without regarding such a result in the case of five or even ten per cent of our pupils as serious cause for attempting to develop vocational guidance as a primary aim in that work.

VI

PROPOSALS FOR HOUSEHOLD ARTS [1]

The Home Project. — In planning for work in household arts, it is of primary importance to remember that substantially every girl of from twelve to sixteen years of age to be reached by it lives as a member of a household and in the constant presence of the activities involved in the purchase and preparation of food, selection, construction, and upkeep of clothing, nursing of children, home management, etc. The girl in the home, like the boy on the farm, has readily accessible in her own surroundings all the equipment required for the pursuit of household arts. The situation here is radically different from anything now found in the domains of industrial and commercial activities, where, if we desire to use examples for education, we must usually create complete special equipment for this purpose.

Hence, the equipment provided by the school for the teaching of household arts should be considered chiefly as complementary to that already existing in the home environment of the pupil, and its use should be of such a nature as constantly to correlate with projects executed at home under the inspiration and supervision of the department of household arts in the school.

As in the case of those taking commercial arts, pupils taking household arts will in many cases later enter upon the vocations (homemaking, chiefly) upon which the practical arts work is based. Obviously, however, there is a marked difference. Under present conditions, few city girls enter upon homemaking in a genuinely vocational way until they are from twenty to twenty-five years of age, and after a considerable period of wage-earning in vocations unrelated to homemaking. Hence, household arts will serve

[1] See also discussion of this topic in chapter on Homemaking Education.

little or no purpose as vocational guidance. But it can be made, without doubt, to lay important foundations for better appreciation, taste, utilization, and standards of living.

Probably a suitable center for household arts instruction on the basis of non-vocational practical arts should provide as essential equipment the differentiated accommodations of a home — namely, bedroom, kitchen, and living room, with provision for separate parlor, dining room, pantry, cellar, etc., in environments where these prevail as accommodations for a majority of those whom the school serves. But, clearly, these should serve chiefly for the initial exemplification of projects that should, like those of home gardening, be executed in the home. They would be used chiefly for demonstration. It is needless to say that the standards employed in demonstration cannot greatly surpass in costliness, finish, or general excellence those accessible to the pupils in their homes, without nullifying the usefulness of the instruction given.

As in the case of other forms of practical arts, the chief work of the pupils will be found in connection with projects. Of these every home offers a wide range of possible choices. The following classification of projects and topics used in a manual prepared by a committee of the faculty of the household arts department of the Massachusetts State Normal School at Framingham has proved suggestive:

1. The buying, preparation, and serving of food, grades 7–10:
   (*a*) Working projects — school and home:
      1. Preparing cocoa
      2. Rolled oats
      3. Apple sauce
      4. Fruit canning
      5. Wheat muffins
      6. Tapioca custard
      7. Beef stew

(*b*) Working projects — school:
1. Pot roast
2. Coffee
3. Dried pea soup

(*c*) Topics:
1. Cereals
2. Milk foods
3. Beverages
4. Vegetable cookery
5. Evaporated fruits and vegetables

(*d*) Home projects:
1. The preparation of a family breakfast
2. The canning of fruit for winter use

(*e*) Observation and report projects — none

2. The buying, making, and upkeep of clothing, grades 7–10:

(*a*) Home and school working projects:
1. The making of a kimono and nightgown
2. Repair by means of hemmed patch
3. Making bag for dust cloth
4. Buying, repairing, and laundering stockings
5. Making of summer dress

(*b*) Home projects:
1. The family mending basket
2. Shrinking of cottons

(*c*) School projects:
1. Making of pattern
2. Pressing of ribbons

(*d*) Observation and report projects:
1. Sewing equipment
2. The sewing machine

(*e*) Topics:
1. Study of cotton dress materials for school wear
2. Laundering of cotton dress materials
3. Care and repair of woolen garments
4. Styles
5. Clothing budget for school girl
6. Comparative cost of home and public laundering

3. Household management, grades 7–10:
   (*a*) Home working projects:
      1. Care of a bedroom
      2. The making of a bed
      3. Setting of a dining-room table
      4. Use of decorative plants in home
      5. Care of fixtures and fittings of a bathroom
      6. Campaign against household pests
      7. Decoration of living room
   (*b*) School working projects:
      1. Making of bed as demonstration in school plant
      2. Growing bulbs for use in home
   (*c*) Observation and report projects:
      1. Study of furniture arrangement in home other than that of pupil
      2. Ventilation of a dining room
      3. Arrangement and care of medicine cabinet
      4. Arrangement and use of cellar space
   (*d*) Topics:
      1. Dangers of dust
      2. The use of sunshine and open air in hygiene
      3. Decoration of the home
      4. Wall papers
      5. Labor-saving devices in kitchen
      6. Readjustments of rooms for summer use

4. Child nursing, grades 8–10:
   (*a*) Home working projects:
      1. The exercise of an infant
      2. The feeding of an infant
      3. The bathing of an infant
      4. The clothing of a child one year of age
   (*b*) Observation and report projects:
      1. The cries of an infant
      2. The sleep of an infant
      3. The clothing of an infant under one year of age
      4. The habits of a child over one year of age

(*c*) Topics:
1. The feeding of an infant in hot weather
2. The exercise and activities of a child one year of age
3. The diseases of children — their prevention and control
4. Infant mortality

5. Housing, tenth grade:
(*a*) Observation and report projects:
1. The hot-air furnace
2. House plumbing
3. House location
4. Use of garden space
(*b*) Topics:
1. Location of house
2. Lighting of house
3. Construction materials, etc.

6. Accounting, tenth grade:
(*a*) Home and school working projects:
1. The elaboration of a family budget
2. Keeping home accounts
(*b*) Topics:
1. The card-index system
2. Standards of living
3. Marketing

7. Illness, tenth grade:
(*a*) Home and school working projects:
1. Use of poultices, compresses, hot-water bags
2. Preparation of food for sick
3. Preparation of trays
4. First aid
(*b*) Observation and report projects — school demonstration:
1. The making of a bed for invalid
2. The giving of a bath to invalid
3. The giving of medicine
(*c*) Topics:
1. Sick-room methods
2. Study of poisons and antidotes
3. Care of patient

VII

PROPOSALS FOR COMMERCIAL ARTS

Paralleling industrial, agricultural, and household arts in well-equipped junior high schools should be a division of commercial arts in which the aims and methods should closely resemble those controlling in the other divisions — that is, the range of activities or projects should be drawn chiefly from the world of trade or commerce; projects satisfying amateur instincts for productive service intermediate between free play and systematic productive work should prevail; and considerable freedom as to individual programs should be allowed.

The fields of commercial activity which seem to offer projects most adapted to the junior high school are: typewriting, bookkeeping, use of calculating machines, filing, drawing of commercial papers and correspondence, simple banking transactions employing "school" money, and simple bank equipment, various buying and selling transactions, etc. Probably stenography is not a suitable source of workable projects.

Because of the superior attractiveness of the commercial occupations it will probably happen that a considerable proportion of pupils electing this division of the practical arts in the junior high schools will eventually enter commercial vocational schools, and later commercial vocations. In many cases parents will look upon this work as possessing definite vocational values and in some cases the resulting knowledge and skill will probably prove vocational assets. Nevertheless, these constitute no good reasons for giving prominence to the vocational aims. Parents should be definitely informed as to the actual purposes controlling in the work, and through vocational guidance pupils should be carefully informed as to vocational possibilities ahead. For

example, persons under eighteen rarely find profitable employment as bookkeepers or typists; the amount of salesmanship that can be taught to girls under fifteen in schools can prove hardly more than a "play" asset towards real salesmanship as a vocation; the business world offers few satisfactory permanent openings to young men as typists and stenographers; and other facts of similar character.

VIII

PEDAGOGICAL UNITS FOR PRACTICAL ARTS COURSES

Teaching Units. — However comprehensive or intricate the final ends of any department of education, it is necessary that the processes shall be greatly subdivided. As in other forms of work, we must break large tasks into units adapted to the working day, and perhaps to the working week, season, and year. These working units may be of a strictly cross-section character, as, for example, where a large "job" is broken into units, one for each day; or they may involve shiftings in the kind of work done, as where a farmer subdivides his large project, "the year's crop," into such unlike sub-projects or stages as (*a*) planning the work, (*b*) putting soil in condition, (*c*) planting, (*d*) tillage of growing plants, (*e*) harvesting, (*f*) marketing, etc.

It is the writer's conviction that in contemporary discussion of curricula and methods, insufficient attention is given to the importance of organizing effective teaching units. The older artificial units of lesson, chapter, etc., have been replaced, it is true, in part by the more logical "topical" organization; but, unfortunately, the latter is in most cases probably too "logical," and insufficiently "pedagogical."

In the practical arts field it ought not to prove difficult to organize a series of serviceable teaching units if the pedagogical principles suggested above prove acceptable. Obviously,

the most important of these units is the "project." As commonly used and defined, the word "project" designates an enterprise or undertaking, the outcome and intermediate means and methods towards the realization of which are held in mind with considerable clearness. We furthermore usually associate with the word a high degree of practicability and an outcome of a definitely material and useful character. We hear much of mining, industrial, agricultural, and commercial projects and we associate with the term fairly detailed plans and specifications. A "proposal" or "proposition" with its "projections" appealing to investors becomes a "project" when details have been elaborated, when experts have passed upon certain aspects.

The Project. — As adapted to school practice, the term might well be confined to those activities which center in the "projection" of a plan for a concrete end to be achieved chiefly through constructive effort of hand working with brain and in which the achievement of the concrete and valuable product is the controlling purpose sought. In this sense, a subject studied in books is not a project; neither is a laboratory experiment in which the end is to ascertain certain facts to add to knowledge. Exercises, even those in composition, typewriting, wood-turning, and draughting, in which the controlling purpose is the enhancement of specific forms of skill and in which the concrete product is in reality a useless by-product, ought not, properly speaking, to be called projects.

The history of manual training shows the evolution of certain types of project teaching. The earlier manual training used, chiefly, exercises. Later, sloyd evolved some "real projects," but of a very formal and stereotyped character, since the sloyd project was very consciously a means to certain definitely conceived ends of skill and knowledge. More recently, manual training has found many real projects, some of which link up genuinely with amateur interests, especially in the grades.

Probably home gardening and household arts (except where needle-work "exercises" still persist) offer at present best developed plans for "project" organization; manual training, or industrial arts, is in transition; while the commercial arts have not yet emerged from the cloudland of quasi-vocational education.

However, other units besides the working project as here described are needed in practical arts. There is a place for a type of learning activity in which the pupil observes the operation of economic processes and their results. If the pupil thus observing is expected simply to retain in memory some of the knowledge he has acquired through observation, then the learning unit might perhaps be called a topic, or, under some circumstances, a demonstration. But if the pupil is expected to organize, formulate, document, and perhaps illustrate the results of his observation, then the whole process could legitimately be called an Observation and Report Project or, possibly, a Survey Project. For example, in household arts, under the general topic "Housing" it would be impracticable for a girl to locate or erect a house. But she could derive much of value as experience and appreciation through observing systematically and carefully the location of one or more houses or the essential features of their construction. If, now, to give definiteness and intelligibility to her observations, a careful plan is made therefor, in the execution of which she records facts, makes drawings, and otherwise gives definiteness and coherence to her work, the whole undertaking might properly be called a "survey" or "observation and report" project. Other examples can be conceived in connection with the inspection of farm devices and product by agricultural arts pupils; visits to mills and other places of concrete productive work by industrial arts pupils; and observation of office procedure by commercial arts pupils.

Topics and Readings. — At least two other kinds of teach-

ing units require a place in practical arts education — namely, topics and readings. Under some circumstances, where concrete work is not practicable, or where it seems desirable to assemble and interpret information from many quarters, the topic will prove valuable. But in practical arts in which emphasis must necessarily be on other than purely intellectual approaches and experience, the topic should always play a minor part.

Of much more importance, probably, will be "readings." Back of every practical achievement the youthful amateur should be conscious that there are to be found in reading matter descriptions, explanations, and interpretations of a technical, social, or popular character, opening up to him the world of adult enterprise. The boy who undertakes a project in "wireless" should at all stages have access to every type of printed matter in that field that can prove suggestive; and similarly for the girl on a bread-making project, the boy or girl on a "potato-raising" project, and the girl on a typewriting project. Where there is shown a disposition to take the readings without the practical project surely it is only the Gradgrinds of education who would discourage the youth; and where an unimaginative boy wants only the project, without any reading, certainly we have no good reason to forbid the play of his natural interests.

IX

THE PROBLEM OF VALUABLE PRODUCT

The question is frequently asked, "Should a valuable product be sought in practical arts work?" Or, with somewhat different meaning, "Should a commercial product be required?"

The question derives in part from contemporary discussion of vocational education. Here the weight of expert

opinion is undoubtedly in favor of requiring a commercially valuable product — that is, one salable in the open market or fit to take the place of a commercial product in domestic or local consumption — as the outcome of almost all practical work done by students. This condition is imposed, notwithstanding endless difficulties of administration, because of the conviction that only through work on salable products or in rendering service which can meet commercial demands can sound vocational training be given. The best vocational schools now require that the pupil shall have his efforts finally measured, not only in terms of the qualitative excellence of his product as judged by market standards, but also in terms of quantitative output — that is, by the learner's rate of work.

Amateur Production. — In the case of genuine practical arts instruction, however, where ends of liberal education chiefly control and the dominant spirit sought in the work is that of the amateur at his best, while the question of a *valuable* product is important, it does not follow that serious attention should be given to the production of a *marketable* or *commercial* product. We can think of an amateur photographer producing photographs that will be valuable to his family and friends, but not salable. In the wood-working shop, the boy may turn out a Morris chair which will long be cherished by his family, but which probably could not be marketed, even if produced in quantity. There is no inherent reason why pupils in practical arts should not produce large quantities of playground apparatus, construct outbuildings, and do useful work in the repair and maintenance of buildings, grounds, plumbing, etc., all of which must be defined as *productive,* but hardly of a commercial character.

On the other hand, in those fields where economic activities, specialization, and exchange are less highly organized, the amateur production of the school may often be substituted for products and service to be obtained in the open

market. Thus the vegetables raised in the home garden will serve just as well the economy of the rural or village home as the product bought outside; the pastry, preserved fruit, and garments made in the household arts department will all serve to take the place of articles that otherwise must be purchased.

Nevertheless, in the economic sense, this amateur practical arts production can never assume much magnitude, since rate of output will hardly ever be a considerable factor in its pedagogy (in sharp contrast with good vocational education) and learners will not be held to routine repetition for the sake of perfecting skill (as will, again, be the case in effective vocational education).

In general, then, we may expect practical arts education, as developed for children upwards of twelve years of age, to result often in products that shall appeal to their producers as valuable — valuable as satisfying instincts of curiosity and construction, as providing facilities for play, as enriching the home, as adding to the equipment of the school community, or even contributing to farm, village, or urban community. The varied activities of the shops, laboratories, and grounds of the Gary schools have always appealed to the writer as being full of suggestions in these respects. The public services rendered in the best amateur spirit by the Boy Scouts also serve to point the way. In several normal schools in Massachusetts, notably those at Fitchburg and North Adams, upper grade pupils have often been enlisted in repair work and minor construction for the institution as a whole. Live rural schools frequently enlist their boys for various building and ground improvement projects, and their girls for provision of hot dishes for lunch in such a way as to effect excellent practical arts teaching. There is to be found large social value in joint or coöperative projects where the visible local community, school, or region is to be benefited. Again, it is evident that project work

which manifestly enriches or improves living conditions for the home and the family, always can be made to have a strong appeal. Successful examples in raising vegetables, canning fruit, baking cakes, repairing shoes, sharpening cutlery and lawn mowers, making furniture, constructing window screens, and making dresses, already are being reported. Others can be developed in keeping accounts, writing business letters, repairing plumbing, varnishing furniture, binding books, installing bell outfits, repairing clothing, etc. In these and endless others yet to be devised the really important ends of practical arts education in effecting general development, widening appreciations, and producing utilities in the amateur spirit can be met.

X

PROBLEM OF CORRELATING PRACTICAL ARTS WITH OTHER SUBJECTS

For almost a quarter of a century, American educators, stirred thereto especially by interpretations of Herbart's educational doctrines, have endeavored to give general application to certain so-called "principles of general method." Of these, the principles of "interest," "correlation," and "inductive method" have been the most clearly defined.

The principle of interest has been widely applied, and with generally good results. But, despite numberless attempts, it is probable that little of substantial value has yet been achieved through application of the principle of correlation.

Each body of subject matter taught in the schools for the sake of building knowledge or specific useful habits tends to have developed its own logical form of organization — that is, stages, sequences, significant centers, etc. This is especially true of those subjects described elsewhere in this chapter, which are administered towards producing "alpha"

types of learning. But the demands of correlation are for such a linking together of subject matter as will prevent the formation in the child of isolated and (apparently) unrelated groups of ideas or unrelated forms of skill. In very few cases have the makers of textbooks or courses of study been successful at once in preserving the logical unity of a given subject — *e.g.* history, drawing, arithmetic, a foreign language, the geography of Asia — and at the same time in effecting any form of unified arrangement with another subject. A few good teaching units wherein are combined certain portions of geography and history, of gardening and natural science, of graphic art and construction, of literature and English language, have been devised; but these, if utilized in each case, are only fragments of the larger subjects from which portions have been abstracted. In no case, so far as the writer is aware, has any substantial portion of the total content of a "subject" used in schools for pupils upward of ten years of age, been used effectively in "correlation" with another.

Nevertheless, teachers are still always in quest of possible "correlations." The logical positions of those who urge more correlations are unassailable; it is only when we try to effect practical applications that our efforts fail.

Problems of Correlation. — In no field of subject matter has the desirability of correlation been more frequently urged than in practical arts. It readily appears that arithmetic and drawing are, or should be, extensively used in manual training; that science is of special significance in gardening and cooking; that accounting should play a large part in the commercial arts, household arts, and agricultural arts; that graphic and plastic art, apart from mechanical drawing, should figure largely in all constructive work; and finally, that in all forms of practical arts there should be opportunity to teach, or at least to give practice in, both the oral and written forms of the English language.

Nevertheless, here again we find few successful attempts at correlation which do not involve the substantial disappearance of one or the other subject as a whole or as a "unity." Of course, where, as in construction work for the lower grades (and perhaps nature study), there can be found no "subject" as a whole, nor any very distinctive educational ends, then its substantial submergence in a more fully organized subject may not be objected to.

But in the seventh and eighth grades, for example, both drawing and arithmetic are assumed to have definite objectives peculiar to these fields, as also does manual training or industrial arts. Can we then successfully "correlate" arithmetic and manual training? Or drawing (or fine arts) and manual training? Practically, it seems that this has not yet been done, and perhaps it cannot be successfully done. This does not mean, of course, that when arithmetic is needed in manual training, fullest possible use should not be made of opportunities to give practice therein — it is only suggested that no matter how far we carry this process we shall only have utilized some fragments of the subject "arithmetic." Again, in teaching arithmetic — that is, in taking the necessary steps to realize the valuable ends that have been set before the teacher of arithmetic — it is to be expected that any source of experience vital to the learner shall be drawn upon for concrete illustrative materials; and these sources will at times include his manual training work. But merely drawing on such a source will not suffice to "teach manual training."

The writer is of the opinion that eventually we shall succeed in realizing some of the ideals of correlation; but in order to do so we must fundamentally revise some existing traditions and standards as to the organization of teaching units. For the present it is not profitable to enter into a discussion of what might be done in this direction.

XI

PRACTICAL ARTS — PLAY OR WORK?

No satisfactory distinctions for purposes of educational theory and practice have yet been drawn between play and work. Practical experience and common sense convince us that important distinctions exist in fact, and that these should have a vital bearing on educational programs.

Formerly, the school was thought of as existing for work only — and intellectual work at that. If pupils were permitted some intermissions for play, this was done only as a grudging concession to recognized necessities of order and capacity for further work. But with more of the child's time at its disposal, a more humane spirit directing, and greater insight into child nature developing, the school began to make provision for play as well as for work. At first play was thought of in the more strictly physical sense. Only lately has it been recognized that what may well be called social play (indoor group games, sociability, visiting, etc.) and intellectual play (desired reading, enjoyment of music, attendance on moving pictures, etc.) are also eagerly sought by children and, within limits, are likewise desirable and necessary for purposes of full development.

Many of the recent enrichments of the curricula of elementary schools — often the "fads and frills" — have been brought in to meet a vague and not always articulate demand, on the part of teachers, for more abundant gratification of these desires for "play." But in any development of this kind we can always recognize the persistence of the old Puritan distrust of play, of anything that savors of the "natural" man. "It doesn't matter what you teach a boy, so long as he doesn't like it, Hennessey," says Mr. Dooley. The persistence of this spirit, opposed by the so-called doc-

trine of interest, has led to a state of much confusion in American education, a confusion growing as much out of our failure to draw necessary distinctions between play and work, as from sheer distrust of play itself.

But the drawing of some of these distinctions, even if not final in all respects, is absolutely essential to a proper determination of the place of practical arts in school curricula. For it is inevitable and probably highly desirable that in some degree the best of the play spirit should enter all practical arts work.

And here we must enter a warning against a too idealistic interpretation, either of child nature or of the relation of education to that nature. No real educator would now deny the very great importance of providing for a large number of activities for all children at least under sixteen years of age that can be executed in the genuine play spirit. On the other hand, only extreme idealists would desire to see the spirit of the kindergarten, even at its best, prevail to the entire exclusion of activities in the work spirit in the grades. From seven or eight years of age onward, probably, children should spend a part of each day in definite work, perhaps even drudgery. The time so spent should not be long — thirty to ninety minutes per day divided into intervals of reasonable length, and rising, perhaps, at age sixteen to four or five hours per day — and it is manifestly important that the pupil and those whose opinion he respects should be convinced that the time so spent will always give profitable results — in terms of useful training, valuable knowledge, power to proceed to higher stages of learning, etc. Against these requirements, the pupil and those influencing him should be helped to recognize clearly those phases of school activity in which the play spirit may dominate.

Play vs. Work. — But how shall we distinguish between play and work? Practically, the world makes these dis-

tinctions largely on the basis of their respective relations to fatigue or weariness, or accompanying lack of interest. Any form of activity may be play so long as the actor has surplus of energy and interest sufficient to make the activity or its immediate results a pleasure in itself. But when it becomes necessary, because of some form of external pressure, to pursue the activity long after immediate interest has been exhausted, then it becomes work. We can think of a man with abundant energy who has done little walking recently, setting out to tramp to a place fifty miles distant. At first his walking gives him all the sensations of play. After perhaps five miles, he reaches the point where, if he were under no compulsion to proceed further, he would terminate the trip. But let us assume a situation where he must go on and complete the trip that day. He settles to what we should now call his task. His muscles become sore, fatigue sets in, all his nature cries out to him to stop. He labors on; he works hard. If he has no personal interest in the trip except to escape pain, we say that it becomes for him drudgery. At the outset we can conceive his desire for the first part of the trip to be, like his available physical energy, a positive or plus quantity; at the end of five miles, his positive desire is diminished to zero. Later it is negative, and increasingly so as he toils along.

Now it is doubtless true that among artists and a few others, valuable contributions to the world's productive service are made in the play spirit, and with all the circumstances of a play time; and it may be, too, that certain classes of routine workers, like business men, have worked so long that the work or routine has become essential to their happiness. But in general, and interpreting the common activities of men, work is done because it has to be done, and play is entered upon because of the immediate appeal it makes. From this point of view, the major portion of the school activities of children are properly to be described as

work — further to be qualified, perhaps, as mental or intellectual work; and the activities which, not prescribed, are entered upon by these same children voluntarily, willingly, joyously — whether games and other physical activities, reading, attendance on photo-plays, or constructive activities — are to be designated as play.

In this connection it should be noted that all modern schools recognize the importance of play — including kinds other than physical — and, where the environment of the pupil proves deficient in providing it, they endeavor to offer compensatory opportunities. All the activities of the kindergarten are supposed to be carried on in the play spirit; in the lower grades it is increasingly assumed that the play spirit should be given free scope; and in higher grades, while this spirit is usually taboo in class work, the free activities — of athletics, social intercourse, literary clubs, etc. — permitted or even encouraged, are testimony to our approval of the play spirit. It is the writer's present conviction that failure in the lower grades clearly to distinguish between those objectives that should be realized in the work spirit and those that should be achieved through the play spirit is a source of extensive and harmful confusion. As stated above, there seem to be no good reasons why even quite young children should not perform a certain amount of very definite work daily, provided the time given to it is suitably alternated with time for play.

Assuming a sharp distinction to be drawn between those objectives of education which belong with play and those others that should be realized in the spirit of work, to which category does practical arts belong? It is clear that in much of our practical arts training in the past — especially sewing and sloyd — the attempt has been made to hold to the spirit of work, the motive here being to produce the same disciplinary results that were expected from the other "hard" subjects. In gardening, cooking, metal work, wood-turn-

ing, typewriting, etc., it has been much less easy to organize school work in such a way as to bring in sustained routine, and exacting standards with their accompaniments of toil and drudgery. So, perhaps in spite of teachers' intentions, pupils have persisted in taking these subjects much in the same spirit in which they take the games of the playground — and frequently, of course, with the result that some caustic critic would, in the spirit of Mr. Dooley, declare the activities so pursued (hardly to be called "work") to have no "educational value."

The thesis developed elsewhere in this section is, of course, that the really valuable ends of practical arts teaching are probably to be utilized through maximum utilization of the play instincts of children, as best expressed, perhaps, in the term "amateur activities," with all the flexibility, absence of prescription, and refusal to encourage formalism, which that phrase implies.

XII

PRACTICAL ARTS ABOVE THE AGE OF SIXTEEN

The programs of practical arts teaching suggested above are designed principally for children from twelve to sixteen. Are there places for similar offerings for youths above sixteen, perhaps during the last two years of the high school period?

Under present economic and social conditions, from one half to three fourths of all persons have, on or before reaching the age of sixteen, definitely embarked on a vocation, either a juvenile vocation or the early stages of an adult vocation, or else they have entered upon specific training for a vocation. From ten to twenty per cent more of youths will at this time be preparing definitely to enter higher institutions of learning. In all these cases, the desirability of

out-of-school cultural or social interests is to be assumed, but it is doubtful whether these interests will take the form of the amateur constructive work which could be promoted by a school. Where practical interests are strong, it is usually probable that one or more years in a vocational school, even if that be followed by return to a general high school, as frequently happens, for example, in the case of agricultural school students, is to be preferred to further experience with practical arts which may tend at the later age to foster dilettantism.

Furthermore, we have as yet no satisfactory knowledge as to how far a reasonably rich program of practical arts work for pupils during the years from twelve to sixteen, presented as a series of offerings to be elected, will satisfy constructive interests. It is certain that in many cases cultural and developmental needs, so far as they can be satisfied by practical arts education at all, will be met fully by the age of sixteen, when the serious purposes of life begin to take firm hold of the average youth. It would seem, therefore, wise to devote our best efforts in planning and providing for practical arts instruction to the years from twelve to sixteen.

Probably the greatest difficulties in establishing clearly defined schemes of practical arts will be encountered in the departments of household and commercial arts where attempts to serve vocational ends will persist until such time as examples of definite vocational education for the commercial vocations and for homemaking shall have been worked out. It will be hard for many educators, to say nothing of the public, to understand why typewriting, bookkeeping, cooking, and sewing, when taken at all, should not be expected to "function" vocationally.

XIII

PRACTICAL ARTS BELOW THE AGE OF TWELVE

No attempt is made in the present book to interpret the significance and place of practical arts in the education of children under twelve years of age. In current practice the work of the first six grades (with the possible exception of needle-craft in some schools) has no ostensible vocational aim. Consequently, it can be assumed that the controlling aims are found in the enrichment of experience, the provision of vital activity centers for the correlation of the more formal subjects, etc. In more progressive schools, the practical arts instruction now conforms in large measure to the pedagogical standards advocated by those modern educational thinkers who have favored enrichment of curricula and especially the maximum employment of "natural" activities in the learning processes. Existing limitations of practice are due chiefly to the fact that teachers of children in the first six grades, none too well trained at best in the administration of practical arts instruction, are obliged to handle this along with all other subjects, and, frequently, with only the equipment that can be introduced into the ordinary schoolroom. Departmental teaching of practical arts in the lower grades is rarely found, and is not yet seriously proposed except under such conditions of fundamental reorganization of curricula and length of school day as are involved, for example, in the "Gary system."

The published programs of practical arts for the first six grades even yet reveal a wide diversity of underlying pedagogical theories and practice; in fact, the existing situation seems filled with confusion. There is available a wealth of materials, but so far, little satisfactory provision seems to have been made for adapting these to the requirements of the teacher who must teach all subjects to a grade, or to

work out effective correlations with the more formal subjects.

It is the writer's conviction that practical arts instruction in the first six grades represents in many essential respects a field of education materially different in aims and methods from that discussed in this book.

XIV

PRACTICAL ARTS IN THE "GARY SYSTEM"

One of the most impressive features of the much discussed "Gary system" is the large amount of time given to practical arts. This is made possible through the eight-hour school day, of which a period of substantially two hours in length is expected to be devoted regularly to some form of practical arts, including drawing, even in the case of children in the intermediate grades.

The distinctive features of the practical arts work (chiefly in industrial, commercial, and household arts fields) in the schools of Gary are these: pupils are expected to engage in *serviceable* or *useful* activities — the exercise basis is not approved; and the teachers in each department must be capable of doing skilled productive work in that department — whether that be bookkeeping, printing, plumbing, preparation of meals, painting, shoe repairing, or school furniture making.

Accepting as impracticable for the present any attempt to sell the products of the practical arts department, and recognizing the limited demand which the homes of the pupils can provide, the Gary school authorities have taken over for the practical arts departments various forms of necessary work within the school system itself, such as printing forms and leaflets, painting buildings, repairing plumbing, wood and electrical work, keeping accounts, preparing and serving

of school lunches, making playground apparatus and school furniture, etc. For each department of work one or more skilled artisans or practical workers are supplied, these to lead in doing practical work and to use the pupils as assistants. It is intended that the productive work done by these departments shall not cost the school system more than would have been required to procure equivalent service in open market.

Because of the variety of practical work offered, individual pupils have a considerable range of election; and it is apparently designed that the actual administration of practical arts work shall be exceedingly flexible in regard to requirements. For example, pupils desiring to " sample " several fields can take short courses in each; while others desiring to remain a year or more in one department, *e.g.* printing, can apparently have their desires gratified.

A curious arrangement is attempted for younger pupils, those from eight to twelve years of age. Provision is made whereby, on occasion, these may serve as " helpers " or " assistants " to older pupils in their practical arts work — thus acquiring through observation and very elementary participation, experience on a basis of childish experience such as normally comes to a boy on the farm or a girl in the home.

No attempt can be made here to evaluate the results of the Gary system of practical arts teaching. Needless to say, it presents endless difficulties and complexities in its experimental stages (beyond which it has hardly gone as yet), and equally it cannot be doubted that in practice many of the plans held forth can be materialized only to a slight extent.

It is essential, however, to understand clearly, in view of current confusion, that the practical arts work of Gary is not designed primarily to give preparation for a vocation. Its controlling purpose is to provide for actual contact with realities, and first-hand experience in a variety of shops

rather than a broad experience in one shop. The system is organized on the idea that vocational training is the last thing that any of the superintendents of the plants in Gary would wish the schools of Gary to give, even if it were financially possible. The authorities think that there is no demand at all from the employers of labor in the Gary industries for direct vocational education for the children of Gary. What they want is that the public schools send to them boys and girls who are strong physically, industrious, reliable, and intelligent. That is, they want young men who have had a training which gives them a foundation upon which they may learn the things that are to be taught in the industries by the industries themselves.

From the standpoint of the theory of values held by the Gary school authorities, it is desirable that many boys should, for example, take some or many weeks in the printshop; but it is quite immaterial whether any of these ever become printers by vocation. But in order that the printing done by the pupils shall effectively function in their general development and training, it must deal with productive projects, be taught by real printers, and be carried on under approximately commercial conditions.

XV

ADMINISTRATIVE PROBLEMS

The organization and administration of programs of practical arts education, as herein proposed, may naturally be expected to present many unfamiliar and difficult problems, even to those school boards and executives who have already done much with household arts, manual training, commercial education, and gardening. On the other hand, the expense of providing for and conducting the work will doubtless be much reduced as the result of careful planning.

The following are believed to be important considerations relative to the administration of practical arts education for children from twelve to sixteen years of age:

(*a*) Attendance cannot well be made obligatory in those classes where work of *beta* character is being carried out. Compulsory attendance as well as compulsory tasks will defeat the best purposes of the work for those who voluntarily elect it — which, under good teaching, may be expected of not less than eighty per cent of all pupils. If a substantial minority remain who must be forced, then a special type of work should be devised for them, as a sort of awkward or recalcitrant squad under discipline. To this group could be relegated those forcibly excused (or excluded) from the volunteer classes for " non-conformity " or " incompatibility of temperament."

(*b*) Space, equipment, and teaching service for practical arts must be departmentalized. Land area and equipment (for gardening) and home space and equipment (for household arts) should be sought first of all in the homes of the pupils, and only that should be provided in the school which may be required, on the average, to supplement that found outside. For commercial arts and industrial arts, working opportunities outside the school will usually be hard to get, hence the school must be prepared to provide room and equipment for these divisions. It may prove desirable in many cases to provide rooms for practical arts apart from main buildings; and such structures ought frequently to be erected by pupils themselves (*e.g.* sheds for agricultural tools, workshop for mechanical operations, salesrooms, even household arts quarters). In a number of states these would require only crude heating apparatus, if any, since pupils will presumably work standing and will be physically active.

It is also important that equipment should in part be made by pupils, and that, as far as practicable in complicated fields,

equipment discarded in factories, on farms, in offices, and in homes should be employed. From the standpoint of many of the purposes of practical arts, second-hand and even obsolete types of cameras, wood-stoves, typewriting machines, sewing machines, lathes, printing presses, drills, plows, plumbing, bicycles, gas engines, etc., often readily available, should render acceptable service.

(*c*) The school program should provide for a possible two hours daily or ten hours weekly in practical arts, for all pupils who have no outside employment. In many school systems this would involve lengthening the school day. The writer favors the so-called Gary form of administration in this respect — a long school day, with physical play, practical arts, and strictly academic studies, alternating in such a way that space and equipment suited to each major type of activity are in constant use. Special exemptions as to hours should be made for pupils having outside employment. Obviously, a large amount of flexibility in administration of practical arts work must be provided for. Pupils are presumed to be free to elect any one of the major divisions; and, if varied offerings are available within any one of these, to elect projects. As indicated above, it may also be assumed that pupils are free to take no practical arts at all, provided school time is otherwise profitably employed.

(*d*) Teaching force. For any given field of education we can only expect to find fully equipped teachers available some years after we shall have defined the field and developed a general demand for suitable teachers. Doubtless, few teachers are now available for the types of practical arts here proposed, but many manual training, commercial, agricultural, and household arts teachers could, with some encouragement and special training, adapt themselves to the requirements of the new work.

Eventually should be developed assistant, non-salaried teachers or leaders from among older pupils themselves, as

has been done so successfully among the Boy Scouts. We talk often about the schools as agencies to train leaders, but we give almost no opportunity in the organized work of schools (many such opportunities are found in the voluntary activities of the pupils themselves) for experience in leading or directing. Of course, this assistant teaching service itself should be organized on a " short unit " project basis, as all the work in practical arts.

(*e*) The financial support of practical arts education, like all new things sought in progressive school systems, will require additional revenues, but probably not greatly more than is now given for similar work. If, through the practical arts department, school buildings can be kept in repair and a variety of constructive work for the municipality be done, as seems to be a demonstrated possibility in Gary, a part of the cost, at least, would be offset. Again, as suggested above, if vocational ends are disregarded, much of the necessary equipment can be made by pupils, or can be purchased second-hand at nominal cost.

CHAPTER XVI

BIBLIOGRAPHIES

The literature of vocational education consists largely as yet of magazine articles, school reports, and bulletins. The time is hardly ripe for the making of a critical bibliography of this material. The bibliographies referred to below are easily accessible and will suffice fairly well for the beginner. Students doing special work on any topic will find it necessary at an early stage to supplement titles found in these bibliographies through research of their own.

1. Under topical titles used in the index of this book articles of value will often be found in: Monroe's *Encyclopedia of Education;* Poole's *Index; Readers' Guide; Bibliography of Books on Education in Columbia University Library;* Burnham's *Bibliographies of Books on Educational Subjects* (Clark University, 1912); and U. S. Bureau of Education's *Monthly Record of Current Educational Publications.*

2. The following are special bibliographies: National Society for the Promotion of Industrial Education, *Selected Bibliography on Industrial Education, Bul. No.* 2 — U. S. Bureau of Education, Bul. No. 22 (1913); *Bibliography on industrial, vocational and trade education.* — U. S. Bureau of Education, Bul. 10 (1912); *Bibliography of Education in agriculture and home economics* — U. S. Bureau of Education (June, 1914); *List of references on vocational education.*

3. Valuable special bibliographies will be found in these books: U. S. Commissioner of Labor, *Annual Report,* 1910,

pp. 521–539. . . . National Education Association, Proceedings, 1910, pp. 766–774. . . . Lapp, John, *Learning to Earn,* pp. 381–389. . . . Dean, A. D., *The Worker and the State,* pp. 345–355. . . . Monroe, P., *Principles of Secondary Education, passim.* . . . Johnston, C. H., *High School Education, passim.* . . . Johnston, C. H., *The Modern High School, passim.* . . . Robinson, E. (Readings in) *Vocational Education,* pp. xi–xlix (useful for magazine references). . . . Manual Training Magazine, Vol. 17, pp. 372–376 (bibliography of vocational surveys).

4. For fundamental ethical and economic problems, useful bibliographies can be found in: Dewey and Tufts, *Ethics* (chapter references); and *Guide to Readings in Social Ethics and Allied Subjects* (Harvard, 1910).

APPENDIX A. OCCUPATION STATISTICS

The statistics reproduced below from the Thirteenth U. S. Census are given space here because they exhibit better than could any verbal description, the almost bewildering variety of vocations that are now followed by American workers. These tables, too, will abundantly repay study on the part of persons interested in such topics as the specialization of industrial pursuits, the prevalence of women in wage-earning occupations, the proportions of workers in different occupations, and the numbers of the so-called semi-skilled in manufacturing pursuits.

Table I is an analysis of all wage-earning occupations. Table II illustrates the varieties of special vocations found in one line of manufacturing (and it will be remembered that the automobile industry was still in its childhood stage in 1910). Table III illustrates the subdivisions now made in the vocations of salesmanship.

TABLE I. — Total Persons 10 Years of Age and Over in each Specified (Gainful) Occupation, Classified by Sex: U. S. Census, Vol. 10, 1910

Occupation	Total	Male	Female
Population 10 years of age and over	71,580,270	37,027,558	34,552,712
All occupations	38,167,336	30,091,564	8,075,772
I. Agriculture, forestry and animal husbandry	12,659,203	10,851,702	1,807,501
Dairy farmers	61,816	59,240	2,576
Dairy farm laborers	35,014	32,237	2,777
Farmers	5,865,003	5,607,297	257,706
Farm laborers	5,975,057	4,460,634	1,514,423

TABLE I. — *Continued*

Occupation	Total	Male	Female
Farm laborers (home farm)	3,310,534	2,133,949	1,176,585
Farm laborers (working out)	2,636,966	2,299,444	337,522
Turpentine farm laborers	27,557	27,241	316
Farm, dairy farm, garden, orchard, etc., foremen	47,591	39,826	7,765
Dairy farm foremen	1,086	1,001	85
Farm foremen	42,420	34,915	7,505
Garden and greenhouse	1,311	1,223	88
Orchard, nursery, etc.	2,774	2,687	87
Fishermen and oystermen	68,275	67,799	476
Foresters	4,332	4,332	.....
Gardeners, florists, fruit growers, and nurserymen	139,255	131,421	7,834
Florists	9,028	7,977	1,051
Fruit growers and nurserymen	46,541	44,186	2,355
Gardeners	79,894	75,481	4,413
Landscape gardeners	3,792	3,777	15
Garden, greenhouse, orchard and nursery laborers	133,927	126,453	7,474
Cranberry bog laborers	1,384	1,316	68
Garden laborers	81,314	76,372	4,942
Greenhouse laborers	17,757	16,796	961
Orchard and nursery laborers	33,472	31,969	1,503
Lumbermen, raftsmen, and woodchoppers	161,268	161,191	77
Foremen and overseers	4,798	4,798	.....
Lumbermen and raftsmen	114,036	113,999	37
Teamsters and haulers	15,038	15,038	.....
Woodchoppers and tie cutters	27,396	27,356	40
Owners and managers of log and timber camps	7,931	7,927	4
Stock herders, drovers, and feeders	62,975	62,090	885
Stock raisers	52,521	50,847	1,674
Other agricultural and animal husbandry pursuits	44,238	40,408	3,830
Apiarists	2,145	2,020	125
Corn shellers, hay balers, grain threshers, etc.	5,617	5,617	.....
Ditchers	15,198	15,198	.....

TABLE I. — *Continued*

Occupation	Total	Male	Female
Poultry raisers and poultry yard laborers	15,384	11,777	3,607
Other and not specified pursuits	5,894	5,796	98
II. Extraction of minerals	964,824	963,730	1,094
Foremen, overseers, inspectors	23,338	23,328	10
Operators, officials and managers	25,234	25,127	107
Coal mine operatives	613,924	613,519	405
Copper mine operatives	39,270	39,251	19
Gold and silver mine operatives	55,436	55,397	39
Iron mine operatives	49,603	49,564	39
Operatives in other mines	47,252	47,169	83
Quarry operatives	80,840	80,795	45
Oil, gas and salt well operatives	29,927	29,580	347
Oil and gas well operatives	25,562	25,548	14
Salt well and works operatives	4,365	4,032	333
III. Manufacturing and mechanical industries	10,658,881	8,837,901	1,820,980
Apprentices	118,964	103,369	15,595
Apprentices to building and hand trades	28,031	27,999	32
Dressmakers' and milliners' apprentices	12,011	31	11,980
Other apprentices	78,922	75,339	3,583
Bakers	89,531	84,752	4,779
Blacksmiths, forgemen	240,519	240,488	31
Blacksmiths	232,988	232,957	31
Forgemen, etc.	7,531	7,531	.....
Boiler makers	44,761	44,761	.....
Brick and stone masons	169,402	169,387	15
Builders and building contractors	174,422	173,573	849
Butchers' dressers (slaughterhouse)	16,351	16,349	2
Cabinet makers	41,892	41,884	8
Carpenters	817,120	817,082	38
Compositors, linotypers and typesetters	127,589	113,538	14,051
Coopers	25,299	25,292	7
Dressmakers and seamstresses (not in factory)	449,342	1,582	447,760
Dyers	14,050	13,396	654

TABLE I. — *Continued*

Occupation	Total	Male	Female
Electricians and engineers	135,519	135,427	92
Electrotypers, stereotypers and lithographers	12,506	11,929	577
Electrotypers — stereotypers	4,368	4,268	100
Lithographers	8,138	7,661	477
Engineers (mechanical)	14,514	14,514	.....
Engineers (stationary)	231,041	231,031	10
Engravers	13,967	13,429	538
Filers, grinders, buffers and polishers (metal)	49,525	46,679	2,846
Buffers and polishers	30,496	28,191	2,305
Filers	10,236	10,069	167
Grinders	8,793	8,419	374
Firemen (except locomotive and fire department)	111,248	111,248	.....
Foremen and overseers (manufacturing)	175,098	155,358	19,740
Furnacemen, smeltermen, beaters, pourers, etc.	36,251	36,226	25
Furnacemen and smeltermen	19,735	19,719	16
Beaters	10,120	10,111	9
Ladlers and pourers	679	679	.....
Puddlers	5,717	5,717	.....
Glass blowers	15,564	15,474	90
Jewelers, watchmakers, goldsmiths and silversmiths	32,574	30,037	2,537
Goldsmiths	5,757	5,553	204
Jewelers and lapidaries (factory)	10,631	8,783	1,848
Jewelers and watchmakers	16,186	15,701	485
Laborers:			
Building and hand trades	934,909	919,031	15,878
General and not specified	869,478	853,679	15,799
Helpers — building and hand trades	65,431	65,352	79
Chemical industries	41,741	39,711	2,030
Fertilizer factories	9,847	9,757	90
Paint factories	2,959	2,842	117
Powder, cartridge, fireworks, etc., factories	4,277	3,947	330
Other chemical factories	24,658	23,165	1,493

TABLE I. — *Continued*

Occupation	Total	Male	Female
Clay, glass, stone industries	154,826	152,438	2,388
Brick, tile, terra cotta factories	77,954	77,333	621
Glass factories	24,634	23,686	948
Lime, cement, gypsum factories	36,083	35,931	152
Marble and stone yards	6,915	6,847	68
Potteries	9,240	8,641	599
Iron and steel industries	482,941	476,801	6,140
Automobile factories	15,783	15,644	139
Blast furnaces, rolling mills	202,392	201,030	1,362
Car and railroad shops	48,342	48,114	228
Wagon and carriage factories	12,391	12,232	159
Other iron and steel works	204,033	199,781	4,252
Other metal industries	44,773	42,134	2,639
Brass mills	10,885	10,606	279
Copper factories	11,586	11,532	54
Lead and zinc factories	7,945	7,871	74
Tinware and enamel factories	7,587	6,709	878
Other metal factories	6,770	5,416	1,354
Lumber and furniture industries	317,244	313,228	4,016
Furniture, piano and organ factories	28,077	27,188	889
Saw and planing mills	260,142	258,361	1,781
Other wood working factories	29,025	27,679	1,346
Textile industries	87,146	71,107	16,039
Cotton mills	37,804	32,037	5,767
Silk mills	3,798	2,686	1,112
† Woolen and worsted mills	12,290	10,245	2,045
Other textile mills	33,254	26,139	7,115
Other industries	426,126	386,897	39,229
Charcoal and coke works	11,446	11,431	15
Cigar and tobacco factories	16,392	11,436	4,956
Clothing industries	10,240	5,424	4,816
Electric light and power plants	8,176	8,011	165
Electrical supply factories	11,434	10,053	1,381
Food industries:			
Bakeries	4,510	3,755	755
Butter and cheese factories	4,816	4,688	128
Fish curing and packing	4,870	4,637	233
Flour and grain mills	9,243	9,152	91
Fruit and vegetable canning, etc.	4,670	3,683	987

TABLE I. — *Continued*

Occupation	Total	Male	Female
Slaughter and packing houses	33,903	32,471	1,432
Sugar factories and refineries	8,755	8,647	108
Other food factories	11,248	8,658	2,590
Gas works	16,549	16,534	15
Liquor and beverage industries	18,857	18,294	563
Oil refineries	11,215	11,151	64
Paper and pulp mills	31,388	29,959	1,429
Printing and polishing	7,041	5,217	1,824
Rubber factories	13,546	12,224	1,322
Shoe factories	10,277	7,952	2,325
Tanneries	20,798	20,491	307
Turpentine distilleries	6,405	6,354	51
Other factories	150,347	136,675	13,672
Loom fixers	13,254	13,254	.....
Machinists, millwrights, tool makers	488,049	487,956	93
Machinists and millwrights	478,786	478,713	73
Tool makers, die setters, sinkers	9,263	9,243	20
Managers, superintendents (manufacturing)	104,210	102,748	1,462
Manufacturers and officials	256,591	251,892	4,699
Manufacturers	235,107	230,809	4,298
Officials	21,484	21,083	401
Mechanics	34,787	34,745	42
Gunsmiths, locksmiths, bellhangers	3,251	3,248	3
Wheelwrights	3,732	3,732	.....
Other mechanics	27,804	27,765	39
Millers (grain, flour, seed, etc.)	23,152	23,093	59
Milliners and millinery dealers	127,906	5,459	122,447
Molders, founders, casters (metal)	120,900	120,783	117
Brass molders, founders, casters	6,512	6,509	3
Iron molders, founders, casters	112,122	112,070	52
Other molders, founders, casters	2,266	2,204	62
Oilers of machinery	14,013	13,990	23
Painters, glaziers, varnishers, enamelers, etc.	337,355	334,814	2,541
Enamelers, lacquerers and japanners	2,999	1,968	1,031
Painters, glaziers and varnishers (buildings)	273,441	273,060	381

TABLE I. — *Continued*

Occupation	Total	Male	Female
Painters, glaziers and varnishers (factory)	60,915	59,786	1,129
Paper hangers	25,577	24,780	797
Pattern and model makers	23,559	23,006	553
Plasterers	47,682	47,676	6
Plumbers and gas and steam fitters	148,304	148,304	.....
Pressmen (printing)	20,084	19,892	192
Rollers and roll hands (metal)	18,407	18,384	23
Roofers and slaters	14,078	14,078	.....
Sawyers	43,276	43,257	19
Semi-skilled operatives:			
Chemical industries	30,705	17,158	13,547
Paint factories	3,920	3,292	628
Powder, cartridges, fireworks, etc., factories	5,263	2,858	2,405
Other chemical factories	21,522	11,008	10,514
Cigar and tobacco factories	151,519	79,947	71,572
Clay, glass and stone industries	88,628	79,167	9,461
Brick, tile and terra cotta factories	13,407	12,649	758
Glass factories	41,877	37,927	3,950
Lime, cement and gypsum factories	8,546	8,417	129
Marble and stone yards	8,539	8,389	150
Potteries	16,259	11,785	4,474
Clothing industries	144,607	95,715	48,892
Hat factories (felt)	26,575	22,377	4,198
Suit, coat, cloak, overall factories	54,211	44,878	9,333
Other clothing factories	63,821	28,460	35,361
Food industries	88,834	52,312	36,522
Bakeries	8,938	3,008	5,930
Butter and cheese factories	11,598	11,065	533
Candy factories	30,943	13,608	17,335
Flour and grain mills	3,992	3,750	242
Fruit and vegetable canning, etc.	5,290	2,127	3,163
Slaughter and packing houses	9,448	7,121	2,327
Other food factories	18,625	11,633	6,992
Harness and saddle industries	22,650	21,958	692
Iron and steel industries	368,313	345,271	23,042
Automobile factories	20,902	20,222	680

TABLE I. — *Continued*

Occupation	Total	Male	Female
Blast furnaces and rolling mills	70,130	67,746	2,384
Car and railroad shops	47,684	47,405	279
Wagon and carriage factories	22,178	21,236	942
Other iron and steel works	207,419	188,662	18,757
Other metal industries	69,750	48,904	20,846
Brass mills	16,885	14,350	2,535
Clock and watch factories	15,628	9,252	6,376
Gold and silver and jewelry factories	16,651	10,474	6,177
Lead and zinc factories	1,864	1,601	263
Tinware and enamelware factories	10,611	6,674	3,937
Other metal factories	8,111	6,553	1,558
Liquor and beverage industries	31,503	29,664	1,839
Breweries	21,830	21,250	580
Distilleries	3,444	2,648	796
Other liquor and beverage factories	6,229	5,766	463
Lumber and furniture industries	167,490	154,292	13,198
Furniture, piano and organ factories	62,812	58,304	4,508
Saw and planing mills	66,060	63,684	2,376
Other wood working factories	38,618	32,304	6,314
Paper and pulp mills	36,383	25,803	10,580
Printing and publishing	67,469	32,808	34,661
Shoe factories	181,010	121,744	59,266
Tanneries	33,553	31,713	1,840
Textile industries:			
Beamers, warpers, slashers	16,693	9,612	7,081
Cotton mills	7,693	4,855	2,838
Silk mills	4,628	1,408	3,220
Woolen and worsted mills	2,570	2,059	511
Other textile mills	1,802	1,290	512
Bobbin boys, doffers and carriers	22,514	17,622	4,892
Cotton mills	16,798	14,398	2,400
Silk mills	617	320	297
Woolen and worsted mills	2,899	1,824	1,075
Other textile mills	2,200	1,080	1,120
Carders, combers and lappers	23,956	18,050	5,906
Cotton mills	15,939	11,729	4,210

TABLE I. — *Continued*

Occupation	Total	Male	Female
Silk mills	143	60	83
Woolen and worsted mills	5,358	4,447	911
Other textile mills	2,516	1,814	702
Drawers, rovers and twisters	29,995	12,480	17,515
Cotton mills	19,472	9,535	9,937
Silk mills	3,825	1,472	2,353
Woolen and worsted mills	4,465	866	3,599
Other textile mills	2,233	607	1,626
Spinners	74,059	27,783	46,276
Cotton mills	48,025	15,874	32,151
Silk mills	3,443	1,046	2,397
Woolen and worsted mills	13,387	6,997	6,390
Other textile mills	9,204	3,866	5,338
Weavers	203,718	104,284	99,434
Cotton mills	92,840	48,929	43,911
Silk mills	36,171	18,435	17,736
Woolen and worsted mills	31,857	17,197	14,660
Other textile mills	42,850	19,723	23,127
Winders, reelers and spoolers	64,333	7,270	57,063
Cotton mills	27,509	3,226	24,283
Silk mills	16,126	1,222	14,904
Woolen and worsted mills	7,543	932	6,611
Other textile mills	13,155	1,890	11,265
Other occupations	214,992	101,120	113,872
Cotton mills	50,349	30,625	19,724
Silk mills	13,820	4,995	8,825
Woolen and worsted mills	30,891	18,601	12,290
Other textile mills	119,932	46,899	73,033
Other industries	308,861	191,925	116,936
Electrical supply factories	24,677	13,636	11,041
Paper box factories	17,887	4,859	13,028
Rubber factories	30,283	20,814	9,469
Other factories	236,014	152,616	83,398
Sewers and sewing machine operators (factory)	291,209	60,003	231,206
Shoemakers and cobblers (not in factory)	69,570	68,788	782
Skilled occupations	16,808	16,560	248
Annealers and temperers (metal)	1,901	1,894	7
Piano and organ tuners	6,633	6,528	105

TABLE I. — *Continued*

Occupation	Total	Male	Female
Wood carvers	5,368	5,308	60
Other skilled occupations	2,906	2,830	76
Stonecutters	35,731	35,726	5
Structural iron workers (building)	11,427	11,427	.....
Tailors and tailoresses	204,608	163,795	40,813
Tinsmiths and coppersmiths	59,833	59,809	24
Tinsmiths	56,423	56,399	24
Coppersmiths	3,410	3,410	.....
Upholsterers	20,221	18,928	1,293
IV. Transportation	2,637,671	2,531,075	106,596
Water transportation (selected occupations):			
Boatmen, canalmen and lock keepers	5,304	5,289	15
Captains, masters, mates and pilots	24,242	24,242	.....
Longshoremen and stevedores	62,857	62,813	44
Sailors and deck hands	46,510	46,498	12
Road and street transportation (selected occupations):			
Carriage and hack drivers	35,376	35,339	37
Chauffeurs	45,785	45,752	33
Draymen, teamsters and expressmen	408,469	408,396	73
Foremen of livery and transfer companies	6,606	6,606	.....
Garage keepers and managers	5,279	5,256	23
Hostlers and stable hands	63,388	63,382	6
Livery stable keepers and managers	34,795	34,612	183
Proprietors and managers of transfer companies	15,598	15,368	230
Railroad transportation (selected occupations):			
Baggagemen and freight agents	17,033	17,028	5
Baggagemen	12,273	12,273	.....
Freight agents	4,760	4,755	5
Boiler washers and engine hostlers	10,409	10,409	.....
Brakemen	92,572	92,572	.....
Conductors (steam railroad)	65,604	65,604	.....
Conductors (street railroad)	56,932	69,693	.....
Foremen and overseers	69,933	56,932	240

TABLE I. — *Continued*

Occupation	Total	Male	Female
Laborers	570,975	567,522	3,453
Steam railroads	543,168	539,920	3,248
Street railroads	27,807	27,602	205
Locomotive engineers	96,229	96,229	.....
Locomotive firemen	76,381	76,381	.....
Motormen	59,005	59,005	.....
Officials and superintendents	22,238	22,236	2
Steam railroads	19,805	19,803	2
Street railroads	2,433	2,433	.....
Switchmen, flagmen and yardmen	85,147	85,095	52
Switchmen and flagmen (steam railroad)	73,419	73,367	52
Switchmen and flagmen (street railroad)	2,153	2,153	.....
Yardmen (steam railroad)	9,575	9,575	.....
Ticket and station agents	24,138	22,930	1,208
Express, post, telegraph and telephone (selected occupations):			
Agents (express companies)	5,875	5,804	71
Express messengers and railway mail clerks	22,021	22,018	3
Express messengers	6,781	6,778	3
Railway mail clerks	15,240	15,240	.....
Mail carriers	80,678	79,667	1,011
Telegraph and telephone linemen	28,350	28,347	3
Telegraph messengers	9,152	9,074	78
Telegraph operators	69,953	61,734	8,219
Telephone operators	97,893	9,631	88,262
Other transportation pursuits:			
Foremen and overseers	14,738	14,333	405
Road and street building and repairing	7,064	7,064	.....
Telegraph and telephone companies	3,843	3,439	404
Water transportation	3,016	3,016	.....
Other transportation	815	814	1
Inspectors	33,237	32,962	275
Steam railroad	27,661	27,525	136
Street railroad	2,268	2,265	3
Other transportation	3,308	3,172	136

TABLE I. — *Continued*

Occupation	Total	Male	Female
Laborers	221,437	221,176	261
Road and street building and repairing	180,468	180,468	.....
Street cleaning	9,946	9,946	.....
Other transportation	31,023	30,762	261
Proprietors, officials and managers	14,839	13,411	1,428
Telegraph and telephone companies	10,089	8,680	1,409
Other transportation	4,750	4,731	19
Other occupations (semi-skilled)	38,693	37,729	964
Steam railroad	24,375	24,105	270
Street railroad	5,187	5,147	40
Other transportation	9,131	8,477	654
V. Trade	3,614,670	3,146,582	468,088
Bankers, brokers and money lenders	105,804	103,170	2,634
Bankers and bank officials	56,059	54,387	1,672
Commercial brokers and commission men	24,009	23,690	319
Loan brokers and loan company officials	2,111	1,989	122
Pawnbrokers	1,232	1,191	41
Stockbrokers	13,729	13,522	207
Brokers not specified and promoters	8,664	8,391	273
Clerks in stores	387,183	275,589	111,594
Commercial travelers	163,620	161,027	2,593
Decorators, drapers and window dressers	5,341	4,902	439
Deliverymen	229,619	229,469	150
Bakeries and laundries	24,030	24,012	18
Stores	205,589	205,457	132
Floorwalkers, foremen and overseers	20,724	17,649	3,075
Floorwalkers and foremen in stores	17,946	14,900	3,046
Foremen, warehouses, stockyards, etc.	2,778	2,749	29
Inspectors, gaugers and samplers	13,446	11,685	1,761
Insurance agents and officials	97,964	95,302	2,662
Insurance agents	88,463	85,926	2,537
Officials of insurance companies	9,501	9,376	125

TABLE I.—*Continued*

Occupation	Total	Male	Female
Laborers in coal and lumber yards, warehouses, etc.	81,123	80,450	673
Coal yards	16,663	16,655	8
Elevators	6,346	6,335	11
Lumber yards	43,398	43,389	9
Stockyards	5,998	5,991	7
Warehouses	8,718	8,080	638
Laborers, porters and helpers in stores	102,333	98,169	4,164
Newsboys	29,708	29,435	273
Proprietors, officials and managers	22,362	21,352	1,010
Employment office keepers	2,260	1,540	720
Proprietors, etc., elevators	5,118	5,105	13
Proprietors, etc., warehouses	4,393	4,368	25
Other proprietors, officials and managers	10,591	10,339	252
Real estate agents and officials	125,862	122,935	2,927
Retail dealers	1,195,029	1,127,926	67,103
Salesmen and saleswomen	921,130	663,410	257,720
Auctioneers	3,990	3,985	5
Demonstrators	4,380	1,250	3,130
Sales agents	35,522	31,424	4,098
Salesmen and saleswomen (stores)	877,238	626,751	250,487
Undertakers	20,734	19,921	813
Wholesale dealers, importers and exporters	51,048	50,123	925
Other pursuits (semi-skilled)	41,640	34,068	7,572
Fruit graders and packers	4,715	2,677	2,038
Meat cutters	15,405	15,378	27
Other occupations	21,520	16,013	5,507
VI. Public service (not classified elsewhere)	459,291	445,733	13,558
Firemen (fire department)	35,606	35,606	.....
Guards, watchmen and doorkeepers	78,271	78,168	103
Laborers (public service)	67,234	66,505	729
Garbage men and scavengers	4,227	4,227	.....
Other laborers	63,007	62,278	729
Marshals, sheriffs, detectives, etc.	23,599	23,219	380
Detectives	6,349	6,162	187
Marshals and constables	9,073	9,071	2
Probation and truant officers	1,043	855	188

TABLE I.—*Continued*

Occupation	Total	Male	Female
Sheriffs	7,134	7,131	3
Officials and inspectors (city and county)	52,254	49,668	2,586
Officials and inspectors (city)	33,210	32,199	1,011
Officials and inspectors (county)	19,044	17,469	1,575
Officials and inspectors (state and United States)	52,926	43,389	9,537
Officials and inspectors (state)	7,202	6,662	540
Officials and inspectors (United States)	45,724	36,727	8,997
Policemen	61,980	61,980	.....
Sailors, soldiers and marines	77,153	77,153	.....
Other pursuits	10,268	10,045	223
Life-savers	2,158	2,158	.....
Lighthouse keepers	1,593	1,552	41
Other occupations	6,517	6,335	182
VII. Professional service	1,663,569	929,684	733,885
Actors	28,297	16,305	11,992
Architects	16,613	16,311	302
Artists, sculptors and teachers of art	34,104	18,675	15,429
Authors, editors and reporters	38,750	32,511	6,239
Authors	4,368	2,310	2,058
Editors and reporters	34,382	30,201	4,181
Chemists, assayers and metallurgists	16,273	15,694	579
Civil and mining engineers and surveyors	58,963	58,958	5
Civil engineers and surveyors	52,033	52,028	5
Mining engineers	6,930	6,930	.....
Clergymen	118,018	117,333	685
College presidents and professors	15,668	12,710	2,958
Dentists	39,997	38,743	1,254
Designers, draftsmen and inventors	47,449	44,437	3,012
Designers	11,788	9,211	2,577
Draftsmen	33,314	32,923	391
Inventors	2,347	2,303	44
Lawyers, judges and justices	114,704	114,146	558
Musicians and teachers of music	139,310	54,832	84,478
Photographers	31,775	26,811	4,964
Physicians and surgeons	151,132	142,117	9,015

TABLE I.—*Continued*

Occupation	Total	Male	Female
Showmen	20,096	18,988	1,108
Teachers	599,237	121,210	478,027
Teachers (athletics, dancing, etc.)	3,931	2,768	1,163
Teachers (school)	595,306	118,442	476,864
Trained nurses	82,327	5,819	76,508
Veterinary surgeons	11,652	11,652	.....
Other professional pursuits	15,677	7,585	8,092
Semi-professional pursuits	64,926	44,532	20,394
Abstractors, notaries and justices	7,445	6,660	785
Fortune tellers, hypnotists, spiritualists	1,600	380	1,220
Healers (not physicians and surgeons)	6,834	2,162	4,672
Keepers of charity and penal institutions	7,491	5,246	2,245
Officials of lodges, societies, etc.	8,215	6,245	1,970
Religious and charity workers	15,970	7,081	8,889
Theatrical owners, managers and officials	11,322	11,027	295
Other occupations	6,049	5,731	318
Attendants and helpers (professional service)	18,601	10,315	8,286
VIII. Domestic and personal service	3,772,174	1,241,328	2,530,846
Barbers, hairdressers, manicurists	195,275	172,977	22,298
Bartenders	101,234	100,984	250
Billiard room, dance hall, skating rink, etc., keepers	16,761	15,943	818
Billiard and pool room keepers	13,859	13,700	159
Dance hall, skating rink, etc.	2,902	2,243	659
Boarding and lodging house keepers	165,452	23,052	142,400
Bootblacks	14,020	14,000	20
Charwomen and cleaners	34,034	7,195	26,839
Elevator tenders	25,035	25,010	25
Hotel keepers and managers	64,504	50,269	14,235
Housekeepers and stewards	189,273	15,940	173,333
Janitors and sextons	113,081	91,629	21,452
Laborers (domestic and professional service)	53,480	50,265	3,215
Launderers and laundresses (not in laundry)	533,697	13,693	520,004

TABLE I. — *Continued*

Occupation	Total	Male	Female
Laundry operatives	111,879	35,899	75,980
Laundry owners, officials and managers	18,043	17,057	986
Midwives and nurses (not trained)	133,043	15,926	117,117
Midwives	6,205	.....	6,205
Nurses (not trained)	126,838	15,926	110,912
Porters (except in stores)	84,128	84,055	73
Restaurant, cafe and lunchroom keepers	60,832	50,316	10,516
Saloon keepers	68,215	66,724	1,491
Servants	1,572,225	262,676	1,309,549
Bell boys, chore boys, etc.	18,329	17,667	662
Chambermaids	39,789	187	39,602
Coachmen and footmen	25,667	25,667	.....
Cooks	450,440	117,004	333,436
Other servants	1,038,000	102,151	935,849
Waiters	188,293	102,495	85,798
Other pursuits	29,670	25,223	4,447
Bathhouse keepers and attendants	4,595	3,125	1,470
Cemetery keepers	4,842	4,811	31
Cleaners and renovators (clothing, etc.)	14,860	12,215	2,645
Umbrella menders and scissors grinders	1,053	1,016	37
Other occupations	4,320	4,056	264
IX. Clerical occupations	1,737,053	1,143,829	593,224
Agents, canvassers, and collectors	105,127	96,325	8,802
Agents	50,785	48,495	2,290
Canvassers	18,595	13,980	4,615
Collectors	35,747	33,850	1,897
Bookkeepers, cashiers, accountants	486,700	299,545	187,155
Clerks (except clerks in stores)	720,498	597,833	122,665
Shipping clerks	80,353	78,192	2,161
Other clerks	640,145	519,641	120,504
Messenger, bundle and office boys	108,035	96,748	11,287
Bundle and cash boys and girls	10,866	4,274	6,592
Messenger, errand and office boys	97,169	92,474	4,695
Stenographers and typists	316,693	53,378	263,315

TABLE II. — Statistical Analysis of Special Vocations within a Certain Industry: U. S. Census, 1910

	Total Workers		Total Workers
Automobile factories	105,758	Body makers (not specified)	1,338
Manufacturers and proprietors	987	Braziers	117
Officials	373	Carriage and wagon builders	214
Managers and superintendents	1,613	Case and steel hardeners	85
Foremen and overseers	2,342	Chauffeurs	780
Bookkeepers, cashiers, accountants	2,299	Core makers	252
Clerks (general)	4,304	Drillers	553
Clerks (shipping)	718	Engine and motor builders (not specified)	102
Designers	155	Filers	208
Draftsmen	1,071	Finishers	943
Messenger, errand and office boys	334	Firemen	234
Purchasing agents	240	Fitters	105
Stenographers and typists	2,074	Forgemen and hammermen	209
Blacksmiths	1,341	Grinders (metal)	499
Boiler makers	73	Helpers	942
Cabinet makers	454	Inspectors	1,258
Carpenters	1,398	Laborers	15,692
Electricians and electrical engineers	1,196	Lamp makers (not specified)	155
Engineers (mechanical)	318	Lathe hands and turners	338
Engineers (stationary)	720	Machine hands (not specified)	1,957
Locksmiths	58	Metal workers (not specified)	660
Machinists	28,659	Molders	529
Mechanics (not otherwise specified)	1,766	Oilers	115
Millwrights	398	Packers and wrappers	148
Painters	4,131	Pattern makers	526
Plumbers	288	Platers	111
Tinners	1,064	Polishers	1,429
Tool makers	1,737	Press hands	245
Wheelwrights	142	Repairers	687
Apprentices	1,104	Rubber workers (not specified)	169
Assemblers and erectors	3,648	Sewers	189
Bench hands	469		

TABLE II. — *Continued*

	Total Workers		Total Workers
Solderers	167	Upholsterers	583
Teamsters	260	Woodworkers (not specified)	1,587
Testers	1,578	Other specified occupations	1,484
Top makers (not specified)	249	Not specified occupations	1,474
Trimmers	2,303		

TABLE III. — Statistical Analysis of Certain Commercial Vocations: U. S. Census, 1910

	Total Workers		Total Workers
Wholesale and retail trade	3,577,771	Candy and confectionery	29,538
Merchants and dealers (wholesale):		Cigars and tobacco	17,728
Importers and exporters	4,905	Carpets and rugs	1,238
Jobbers	3,181	Clothing and men's furnishings	35,273
Other wholesale dealers	42,962	Coal and wood	24,466
Merchants and dealers (retail):		Coffee and tea	5,351
Agricultural implements and wagons	8,518	Crockery and glassware, queensware	2,508
Art stores and artists' materials	2,370	Curios, antiques and novelties	2,735
Automobiles	4,597	Delicatessen stores	3,031
Bicycles	1,532	Department stores	8,970
Books	3,118	Drugs and medicines	67,575
Boots and shoes	19,346	Dry goods, fancy goods and notions	65,283
Butchers and meat dealers	124,048	Five and ten cent stores	4,331
Buyers and shippers of grain	11,535	Florists (dealers)	2,934
Buyers and shippers of live stock	32,516	Flour and feed	9,469
Buyers and shippers of other farm produce	6,864	Fruit	19,000
Buyers and shippers (not specified)	896	Furniture	22,209
		Furs	2,280
		Gas fixtures and electrical supplies	1,526
		General stores	88,059
		Groceries	195,432

TABLE III. — *Continued*

	Total Workers		Total Workers
Hardware, stoves and cutlery	39,663	Newsdealers	7,075
Harness and saddlery	7,541	Oil, paint and wall paper	6,818
Hucksters and peddlers	80,415	Opticians	6,284
Ice	7,361	Produce and provisions	29,639
Jewelry	29,962	Rags	1,975
Junk	15,219	Rubber goods	493
Leather and hides	2,475	Stationery	5,823
Liquors and wines	17,736	Timber	765
Lumber	26,485	Other specified retail dealers	20,383
Milk	14,694	Not specified retail dealers	54,725
Music and musical instruments	5,222		

APPENDIX B. TERMINOLOGY[1]

PRELIMINARY

Education is still largely in the "prescientific" stages of its development. As a consequence, it derives its terms and symbols almost exclusively from the everyday vernacular of the people. But the terminology thus developed necessarily lacks in definiteness and consistency. No two speakers on a given subject will be found to use terms derived from the popular language in exactly the same sense. Great confusion and waste of effort thus result.

The time has not yet arrived for educators to do what has been done in the fields of medicine, engineering, scientific agriculture, and other fields of applied science — that is, develop a technical terminology consisting of new terms and symbols coined for the purpose, and giving exact and unvarying meanings. In education it will be necessary for some time to continue to use, in the main, the old familiar words and phrases, with their numerous variations of meaning and their almost unlimited special connotations.

But educators can do this: They can agree to use certain words and phrases for the time being in certain definite ways, and with certain consistent meanings, and when making departures from this usage clearly indicate the grounds and extent of their divergence from the meaning agreed upon.

To this end there is required a series of definitions of the terms most frequently employed in education, and furthermore, such an extended analysis, with abundance of concrete illus-

[1] These explanatory definitions were first prepared by the author for a committee on vocational education of the National Education Association, and published as Bulletin 24 (1916) of the U. S. Bureau of Education. Suggestions made by many friendly critics have been freely used in revising them for this book.

tration, as will show to anyone acquainted with educational thought actually what is meant by the nomenclature thus established. Most persons find it difficult to translate abstract terms and phrases into concrete and definite meanings. It is obvious also that during any period of marked activity in the development of an educational movement, new and varied situations arise which interest laymen as well as schoolmen. The very rapidity of that growth often anticipates the development of a clearly defined theory of education or social economy. To assist somewhat in avoiding the confusion in thinking and language resulting from the above conditions, this chapter has been prepared. The usual plan has been to follow and precede definitions with an extended analysis of the ideas involved, and to append numerous concrete illustrations of the types of vocational education referred to.

The earlier developments of this type of education in the United States began in Massachusetts. Consequently, there has grown up in that state a considerable background of theory, practice, and experience which has necessitated the use of terms with rather clearly defined meanings. For this reason some of the suggestions as to the use of terms and meanings are based upon usages originating there, more particularly by the board of education, which was required by law to supervise various forms of vocational education. This had made it necessary to evolve, and use consistently, a somewhat definite terminology. Other terms and definitions have, however, been utilized in this terminology. The whole is to be regarded as an effort somewhat to overcome the tendency in one field of education to follow a loose, general, and sometimes almost meaningless terminology.

I. General Definitions and Distinctions

1. (Definition). **Vocational education** is any form of education, whether given in a school or elsewhere, the purpose of which is to fit an individual to pursue effectively a recognized profitable employment, whether pursued for wages or otherwise.

Webster's Dictionary defines vocation as follows: Destined or appropriate employment, calling, occupation, trade, business, profession.

Among the specific occupations for which vocational education may be given are the following: Physician, electrical engineer, teacher, bookkeeper, salesman, stenographer, machinist, plumber, bricklayer, printer, dressmaker, cook, weaver, gardener, florist, farmer, poultryman, homemaker, mother's assistant, domestic servant, sailor, fisherman. This list is capable of being added to indefinitely. There are, at least, some hundreds of different occupations for each of which specific vocational training is practicable.

(*a*) By "purpose" is here meant the purpose or aim which is held in view, and in conformity with which all steps are taken, in arranging programs of instruction, selecting practical work, devising tests, etc. The aim is said to "control" the selection of the means and methods of instruction used in realizing the aim.

For example, if it is the purpose of given courses of training respectively to produce a machinist, a physician, and a printer, the requirements of these respective occupations will control in the choice of the materials and methods of instruction. In the vocational course, as such, matter will not be included which does not have a clearly perceived relationship to efficiency in the vocation.

(*b*) The purposes which should control in a given program of vocational education obviously can be found only by studying the vocation itself for which training is to be given. On the basis of the results of this study, means and methods of training and instruction must be devised, and a predetermined degree of efficiency in the proposed calling constitutes the aim or objective, in the light of the demands of which the means and methods of such training and instruction are selected.

For example, the means and methods employed in the training of a printer may differ absolutely from those employed in the training of a house carpenter. What means (including thereunder subjects of study, courses of instruction, textbooks, material equipment, etc.) and methods (methods of teaching,

class organization, adjustment of practical to technical work, etc.) shall be employed in each case will depend wholly upon the requirements of the occupation itself.

(*c*) The extent to which training can be given for a recognized vocation will, in the last analysis, also depend upon the inherited and acquired powers of the individual who is to be trained, and on the economic conditions determining the age at which the person enters upon the pursuit of a given occupation.

In common practice, only persons of exceptional native endowment and opportunities for prolonged study are admitted to classes preparing for the practice of medicine, engineering, teaching, etc. In every trade school, many applicants are refused, or are early eliminated, because of physical or other unfitness for the successful pursuit of the trade. A person obliged to become self-supporting at 14 or 15 years of age cannot reasonably be expected to profit from the introductory stages of prolonged courses of instruction designed to require the time of a more favored student up to the age of 18 or 20.

(*d*) In practice, any program of vocational education should be based upon the requirements of a definitely analyzed calling, and the means and methods should be modified, so far as practicable, with a view to their adjustment to the needs and possibilities of a group of individuals having a common purpose, and possessed of somewhat similar qualifications.

(*e*) Vocational education of any specific kind "functions" when, as a result of a definite amount of training, an ascertainable degree of proficiency in the exercise of a vocation is shown in the individuals trained.

For example, if it can be shown that a given course of instruction (embracing practical training and theoretical instruction) in dentistry produces in most of those taking such course a definite ability successfully to practice dentistry, then such training is said to "function" effectively. Again, if in the case of a young man, already a successful worker in the machine shop calling, a definite series of short units of training in some form of mathematics or drawing adds obviously to his industrial ability, then such training is said to "function." If,

on the other hand, 40 per cent or 50 per cent of the persons completing, for example, a course of study alleged to fit for farming are able to show no marked improvement in practice as a result of such training, or if an equal number, after having had such training, enter other callings, then the " functioning " of such instruction may be regarded as doubtful or imperfect.

2. **Major divisions of education of equal rank with vocational education.** — Other major divisions of education besides vocational education are: Physical education, social education and cultural education. Physical education may be held to embrace all forms of training and instruction the controlling purposes of which are to conserve and promote useful development of the body and its capacity for effective " functioning." Social education may include all forms of training and instruction designed to make for better group living and activities. Included under this head are moral education, civic education, ethical training, and much of religious instruction. Cultural education may here include all forms of training and instruction designed to develop valuable cultural interests of an intellectual and æsthetic nature, including permanent interests in such fields as art, literature, science, and history. Cultural education also includes training in the use of intellectual " tools," or " instrumentalities " of general (not particular, *i.e.* vocational) application, such as the efficient use of the vernacular language in reading, writing, and speaking, a second language, etc. Social education and cultural education are often described jointly as " general " and in later stages as " liberal " education.

3. **Distinction between general and vocational education.** — General education aims to develop general intelligence, powers of appreciation in all common fields of utilization, and powers of execution with such intellectual instruments as language, mathematics, scientific method, etc., without reference to recognized or specific callings; while vocational education has its aims, and, therefore, its means and methods, determined in any case by the requirements of a specific calling.

For example, experience proves that it is desirable for all

persons to be trained to read and to write, without reference to the specific callings which they may ultimately pursue. Equally, all people should be trained to appreciate and to choose wisely for their own use valuable products from such fields of human effort as literature, art, economic goods, and the specialized service of others. All persons should also be trained in the habitual actions, appreciations, knowledge, insight, and ideals, which constitute approved moral conduct and good citizenship. The forms of education designed to produce these ends may be further subdivided and described by such terms as "elementary education," "academic education," "general secondary education," etc.

4. **Distinction between vocational and practical arts education.** — Vocational education is also to be distinguished from various forms of so-called "practical education," which may resemble, in their processes, vocational education, but which do not result in definite forms of vocational efficiency.

The various forms of non-vocational education here comprised under the term "practical arts," include manual training, sloyd, manual arts, arts and crafts when pursued as part of general education, household arts, simple gardening and agricultural education, many phases of commercial education, etc.

(*a*) The various forms of practical arts education as now given in schools are not properly vocational, although sometimes mistaken for vocational education, because they do not result, except by chance, in recognized forms of vocational efficiency, nor are they assumed to be given to persons who have defined vocational aims. The means and methods they adopt are not selected with a view to the preparation of the pupil for recognized callings.

(*b*) Various forms of practical arts education have an important and valuable place in general or liberal education, as a means of enlarging general intelligence, developing sound appreciation of economic products, and, in part, in laying the foundations for vocational choice.

(*c*) Practical arts education is sometimes termed "prevocational education," because of the belief that a suitable program of practical arts training will make important contributions

toward the individual's ability to choose a vocation wisely. Its value to this end depends largely upon the degree to which the individual has already developed vocational interest and a desire to choose a suitable vocation.

5. **Distinction between direct (or systematic) vocational education and indirect vocational education.** — A large amount of vocational education, in the broad sense of that term, especially for the unskilled or semi-skilled occupations, is an indirect result or a by-product of association and coöperation with older people engaged in productive occupations. One is said to "pick up" skill, vocational intelligence, or vocational ideals in this way. Among primitive peoples usually, and even in civilized society in many fields, such as homemaking and farming, indirect vocational education is common. There is a tendency in society to substitute systematic or direct vocational education for indirect (and therefore, presumably, uneconomic and ineffective) procedures.

6. **Distinction between systematic vocational education through schools and through other agencies.** — Vocational education may be carried on through a school (an agency specialized for this purpose) or through other agencies, primarily specialized for other and, usually, profit-making purposes, and only secondarily adapted to systematic vocational education. Apprenticeship in the trades, and, originally, in the professions, is an example of such non-school systematic vocational education. Farmers and homemakers sometimes quite systematically train their children to follow their own vocations. Commercial establishments often provide for the definite instruction and advancement of young assistants. There is a manifest tendency on the part of society to transfer to school agencies vocational education, because of the greater degree of concentration and effectiveness thus made possible, and because, under modern conditions, economic agencies are unable to give due attention to systematic vocational education as a secondary phase of their responsibilities.

7. **Distinction between private and public vocational schools.** — Vocational schools may be supported by private agencies either through endowments or through fees received from stu-

dents. Such schools, when controlled by private agencies, are called "private vocational schools." They may further be distinguished according as they are (*a*) endowed with more or less philanthropic intent, and having no object of profit in view; or (*b*) as being on a commercial basis in having profit making as a chief end. Public vocational schools are those supported, at least in part, under public expense, and are usually under the control of publicly constituted authorities. Professional schools in state universities, trade and commercial schools conducted by municipalities, agricultural and homemaking schools conducted by states or subdivisions thereof, etc., are examples of public vocational schools.

As a rule, professional schools in the United States have not been organized for profit. Many commercial, and some trade schools, are conducted for profit. Philanthropy has also endowed many trade schools for dependent or defective children.

II. Major Divisions of Vocational Education

1. **Major divisions of occupations.** — The economic or productive occupations (as distinguished from leisure and cultural occupations) which men and women follow (chiefly for self-support) may, for convenience, be grouped in six large classes; namely, the professions, the agricultural pursuits, the commercial pursuits, trades and industries, homemaking pursuits, and nautical pursuits.

The major divisions of wage-earning occupations recognized by the last United States census are: The professions; agriculture; domestic and personal service; trade; clerical occupations; public service; mining; manufacturing and mechanical industries; and transportation. The United States census does not recognize the division of nautical pursuits, nor does it include homemaking pursuits (because non-wage-earning) under the head of domestic occupations. For convenience here mining, manufacturing, and transportation are classed as "industrial" pursuits; and trade and clerical occupations as "commercial pursuits."

2. **Major divisions of vocational education.** — The suitable major divisions of vocational education, corresponding, in the

main, to those of the economic occupations, are these: Professional education, vocational commercial education, vocational agricultural education, vocational industrial education, vocational homemaking education, and nautical education.

It is advantageous to subdivide vocational education into the six divisions given above, because each division has many of its own distinctive pedagogical characteristics, based largely upon the phases of the occupation for which training is being given. It is clear, however, that in many cases a hard and fast classification will not be practicable. For example, cooking as a wage-earning occupation will be classed under the industries, whereas cooking as a part of homemaking will come properly under homemaking education.

For other purposes, vocations may be grouped into (*a*) those requiring a relatively large amount of technical or abstract knowledge, such as the practice of medicine, law, teaching, engineering, and bookkeeping; and (*b*) those requiring or appearing to require a relatively large proportion of manual or other form of bodily skill, such as dentistry, machine-shop practice, dressmaking, and farming. In popular language, the distinction is made between "brain workers" and "hand workers." Also, it is important to make distinctions based on the suitable age at which workers can take up vocations (the so-called "age of efficient entrance into industry"). A person is rarely expected to take up responsible work in the practice of medicine before the age of 22 or 23; in engineering before the age of 20; and in teaching at least before the age of 18. Many trades cannot be followed effectively until the worker has reached the age of 18, on account of the bodily strength required, or responsibility with machinery. Again, industrial vocations are frequently divided into the skilled and unskilled, to many of the former the word "trade" being applied.

(*a*) Because many forms of apparently practical education (*i.e.* training for productive pursuits), which are not in reality vocational (as defined above), are already designated by such terms as "commercial," "agricultural," "industrial," etc., it seems necessary that the term "vocational" should be included in each designation of a form of vocational education except

the professional and nautical, as " vocational commercial education," " vocational agricultural education," etc.

(*b*) There is a sense in which the term " industrial " is also applied to many occupations lying outside of the trades and manufacturing pursuits, as when we speak of " industrial history," " industrial disturbances," " industrial and political development," etc. This usage has also been extended to the field of education, so that there is a popular sense in which " industrial education " means nearly every form of vocational education, except, perhaps, homemaking and professional education. This loose and indefinite usage should be discouraged.

3 (Definition). **Professional education** includes those forms of vocational education the direct purpose of each of which is to prepare individuals for the successful pursuit of a recognized profession.

Among the professions recognized by the United States census are: Law, medicine, engineering, journalism, theology, architecture, acting, dentistry, teaching, music, literature.

Leadership in agriculture, leadership in war, and leadership in institutional management should probably also be included among the professions.

(*a*) Vocational education for the professions, like vocational education for the trades, was formerly carried on through apprenticeship, but now schools of medicine, law, theology, and military leadership have entirely replaced apprenticeship as a means of systematic vocational education for these professions. Schools for these professions originated in some cases several centuries ago. Vocational schools of engineering and teaching were first founded early in the nineteenth century. Almost every profession (except acting, and, in a measure, secondary school teaching and journalism) now has numerous well-organized schools of vocational training. Conscious apprenticeship methods seem to survive only in training for nursing and, in a measure, acting and journalism.

(*b*) In some professions, such as medicine, law, and teaching, the state safeguards standards by means of certification or licensing. In these cases the requirements of such certification greatly affect standards of vocational school work. The

practice of state certification is carried much further in European countries than in America.

(*c*) Certain studies found in schools or colleges, preliminary to the professional course, are now recognized as preparatory or "prevocational" to professional study. Examples of these are biology as prevocational to medicine; history and economics as prevocational to law; trigonometry and physics as prevocational to engineering; etc. It was formerly asserted that studies such as Latin and modern languages were prevocational to almost all of the professions. The validity of this contention is now disputed.

4 (Definition). **Vocational commercial education** includes those forms of vocational education the direct purpose of each of which is to fit for some recognized commercial calling.

Among the commercial callings enumerated by the United States census are those of agent, banker and broker, bookkeeper and accountant, clerk and copyist, commercial traveler, merchant and dealer (retail), merchant and dealer (wholesale), messenger and office boy, officials of banks and companies, packers and shippers, salesmen and saleswomen, stenographers, etc.

Most of the training for commercial pursuits is still obtained in and through the callings themselves. Schools for systematic vocational commercial training exist for only a few occupations, such as those of bookkeeping and accountancy, and stenography and typewriting. A few schools have also been founded to train salesmen and saleswomen, clerks, etc.

(*a*) It is desirable that steps be taken to analyze and define the essential features of the various commercial occupations for purposes of adapting to each its appropriate vocational training. For examples, there are two distinct forms of salesmanship, namely, counter or indoor salesmanship and field or traveling salesmanship. These various types require different school training. But each of these will also be specialized according to types of articles sold and conditions of selling. Selling automobiles has little in common with selling books.

(*b*) The term "commercial education" has also long been employed to designate courses of study dealing with specific

phases of practice or knowledge applicable in, or derived from, the commercial callings. Such education has frequently been fostered as vocational education, although its actual outcome in vocational efficiency — that is, its positive vocational "functioning" — has not been demonstrated and is still in doubt. This has, perhaps, been particularly the case when these alleged vocational studies have been carried on in public high schools. The approach to them has usually been bookish and theoretical, and comparatively slight effort has been made to base either practice or intellectual study on the actual requirements of commercial callings.

The studies commonly employed in this capacity are accountancy, bookkeeping, commercial law, industrial history, history of commerce, business arithmetic, typewriting, stenography, business practice, etc.

(*c*) Much so-called "commercial education" in public and private schools doubtless has, or can be made to have, value as a part of liberal or general education designed to give young people some appreciation of, and insight into, the commercial occupations. Training and instruction of this character might also do much in directing young people toward efficient choice of commercial occupations and in giving vocational ideals.

(*d*) Unfortunately, no clearly defined line is yet drawn, especially in public schools, between commercial studies that are expected to "function" vocationally and those which are designed as part of a general or liberal education. This is a source of much misdirected effort, and probably many young people are permanently handicapped by the failure of schools to distinguish between these two objectives.

5 (Definition). **Commercial education**, or preferably "**commercial arts education**," includes those studies derived from, or based upon, the commercial pursuits which are designed to give liberal or general education and to contribute to vocational guidance and vocational ideals in the field of the commercial occupations.

The term "commercial arts education" may seem somewhat forced in this connection, but there are good analogies in the departments of industrial arts education, agricultural arts education, and household arts education (which see).

6 (Definition). **Vocational agricultural education** includes those forms of vocational education the direct purpose of each of which is to prepare students for some one of the agricultural occupations.

Among agricultural occupations are those of agricultural laborer (in various varieties), dairyman, farmer or planter (many species), gardener, florist or nurseryman, stock raiser, bee keeper, poultry keeper, etc.

Agricultural education of various kinds is now given in agricultural colleges. This includes much work of an essentially secondary grade (in extension classes, etc.), while a part of it is of a collegiate or professional level. A small number of agricultural secondary schools are also equipped to give actual vocational education toward agricultural pursuits.

Agricultural occupations being as yet less specialized than either professional or industrial occupations, agricultural education preserves a relatively general character. Much so-called "agricultural education" is still only quasi-vocational, because it does not give definite and actual preparation for agricultural vocations. But short lecture courses and demonstrations are valuable when offered to experienced farmers, capable of carrying the knowledge thus acquired into practice, making it "function."

(*a*) The term "agricultural education" is also applied to various forms of agricultural study, frequently having as an alleged end vocational education in agriculture. As found in most schools, the studies embraced under agricultural education are usually bookish and theoretical. Their actual "functioning" in competency to pursue such callings as those of the farmer, gardener, florist, poultryman, stock raiser, etc., is often doubtful, but their contributions to general or liberal education may be important.

(*b*) Agricultural education, so called, as now carried on in many schools is, or can be made, a valuable factor in liberal or general education. Appropriate studies under this head can give appreciations of, and insight into, agricultural occupations and the importance of agriculture both as an economic pursuit and as a means of social development. Furthermore, the study

of agriculture to this end may give important vocational guidance and lead to the establishment of vocational ideals. It can also be made a valuable means of illustrating applications of various forms of science. It can, therefore, be regarded as an important form of liberal education.

(*c*) In many cases school authorities seem as yet to make no clear-cut distinction between vocational agricultural education and agricultural instruction, which is actually non-vocational in its results, but may be made of importance in liberal education. As a consequence, effort in this direction is doubtless frequently misdirected.

7 (Definition). **Agricultural arts education** includes those forms of training and study based upon agricultural pursuits and designed to enhance general intelligence, to promote appreciation of agriculture as a form of economic activity, to show wherein various sciences have practical application to human affairs, and to give vocational guidance and to inspire vocational ideals as these relate to the field of agriculture. Agricultural arts education, therefore, constitutes an important division of liberal education, both in the elementary and the secondary field.

8 (Definition). **Vocational industrial education** includes those forms of vocational education the direct purpose of each of which is to fit the individual for some industrial pursuit or trade.

Among the trades and industrial pursuits enumerated by the United States census are those of the carpenter and joiner, mason (brick and stone), painter and varnisher, paper hanger, plasterer, plumber and steam-fitter, roofer and slater, oil-well worker, chemical worker, brick and tile maker, glassworker, marble and stone cutter, potter, fisherman, miner, baker, butcher, confectioner, miller, food packer, blacksmith, iron and steel worker, machinist, boiler maker, stove maker, tool maker, wheelwright, wire worker, shoemaker, harness maker, tanner, bottler, brewer, distiller, cabinet-maker, woodworker in general, brass worker, watchmaker, silver and gold worker, tinplate worker, bookbinder, box maker, engraver, paper-mill operative, printer, lithographer, dyer, cotton-mill operative, knitting-mill

operative, silk-mill operative, woolen-mill operative, dressmaker, hat maker, milliner, seamstress, shirt maker, tailor, broom and brush maker, charcoal burner, steam engineer, fireman, photographer, tobacco operative, upholsterer.

(*a*) For many of the foregoing vocations no systematic vocational education at present exists, either in schools or under non-school agencies.

Among the industrial occupations for which neither organized apprenticeship nor vocational schools as yet offer training are mill operatives (in general), food packers, box makers, general woodworkers, shoemakers (in factories), general iron and steel workers, etc.

(*b*) For a number of the foregoing occupations wherein skill is required, the chief form of training available at the present time is apprenticeship, of a more or less organized character.

The large majority of persons following such pursuits as those of carpenter, plasterer, plumber, stone cutter, machinist, etc., are still trained through the agency of apprenticeship.

(*c*) For some of the foregoing occupations, well-organized vocational schools (generally called trade schools), supported either privately or publicly, are available in various parts of the country, although the total number of workers trained by them constitutes, as yet, but a small proportion of those required by the industry.

Among the occupations for which definitely organized vocational schools, giving either complete training or partial training adjusted to the practice obtained in the industry, are these: Carpenter, house painter, plumber, machinist, bricklayer, cabinet maker, pattern maker, sheet metal worker, bookbinder, sign painter, electrical worker, printer, dressmaker, milliner, etc.

In foreign countries well-organized day or part-time vocational schools are found also for such occupations as those of baker, butcher, weaver, cook, teamster, lithographer.

Some industries have organized special schools for such occupations as those of motorman, glove maker, photographer, linotype operator, telephone operator, confectioner, etc.

(*d*) The term "industrial education" is frequently applied

to a variety of forms of practical, or apparently technical training, based upon operations characteristic of some industries.

Among the forms of so-called practical training to which the term industrial education is sometimes applied are manual training, sloyd, mechanical drawing, technical training, mechanics arts training, printing, bookbinding, metal work, etc.

(*e*) Like commercial arts education, and agricultural arts education described above, the really valuable objectives in "this industrial education" (which may properly be called "industrial arts" education) should be realized through the participation of the pupil in the practical phases of selected processes, as these may be found adapted to the pupil's experience, physical powers, etc. Practical participation in industrial arts processes can be supplemented by reading, visits to industrial establishments, experience in analyzing and assembling machines, etc., all of which may have as a controlling purpose the increasing of the pupil's general intelligence, the stimulation of his powers of wise utilization, the laying of foundations for vocational choice, and the interpreting of contemporary life. All these constitute valuable contributions to general education.

9 (Definition). **Industrial arts education** includes those forms of training and study based upon industrial pursuits and designed to enhance general intelligence and give vocational guidance in the field of industrial occupations.

(*a*) Reform schools for juvenile delinquents have been in the past, and are sometimes still, called "industrial schools." When these institutions ceased to be looked upon merely as prisons, or houses of refuge, public sentiment demanded that vocational training should be given in them, in view of the probable fact that neither the opportunities of apprenticeship nor of home vocational training would be available for these unfortunate youths. Hence, even 50 years ago a form of systematic vocational training was undertaken in reform schools. Probably only a small part of this training ever actually "functioned" in vocational power, because of wrong pedagogical methods employed.

10 (Definition). **Vocational homemaking education** in-

cludes those forms of vocational education the direct object of which is to fit for homemaking as practiced by the wife and mother in the home and also for some specialized forms as practiced by household employees, housekeepers, or other wage-earning assistants to the homemaker.

A large variety of more or less unspecialized activities are carried on in the home. These include the preparation of meals, laundering, house cleaning, garment making, garment repairing, the nursing of children, minor repair work in the equipment of the home, etc. In homes conducted on a somewhat elaborate scale, specialized forms of service may be found, the workers being housekeepers, cooks, waitresses, chambermaids, nurses, butlers, janitors, etc.

Among occupations which were formerly carried on in the home, but have been since specialized away from it, are those of spinning, weaving, milking, butter and cheese making, tanning, barbering, brewing, food packing, shoemaking, furniture making, etc. Other occupations which now seem to be in process of being specialized away from the home are baking, garment making, fruit preserving, etc.

(*a*) As in the case of farming, there is comparatively little specific vocational differentiation within the average home. Notwithstanding the removal from the home of many specific forms of productive work, homemaking remains a distinctive and clearly defined vocation for the wife and mother living under normal family relations as well as for specialist workers in homes and institutions. It is ordinarily a composite vocation, utilizing various forms of skill and related knowledge. Vocational education for homemaking must, therefore, aim to produce as many forms of power as the distinctive home operations now require, each to a degree suited to the time, energy, and native ability of the learner. It is especially necessary that in the homemaker an harmonious union of various forms of skill and knowledge should be found.

(*b*) From 60 per cent to 80 per cent of all women eventually become homemakers. Modern social and economic conditions are such that the majority of these spend the years from substantially 16 to 20 or 25 in wage-earning pursuits (only a small

proportion being connected with homes), after which homemaking is entered as a career to be followed for life, or at least for many years.

(*c*) During recent years, many forms of education have been introduced into private and public schools as designed to minister to the development of homemaking power or appreciation. These are variously named "household arts," "domestic science," "domestic arts," "household economics," "home economics," "domestic economy," etc. Frequently they have been introduced into schools as subjects of study and laboratory experiment on the same basis as other studies. The extent to which these studies "function" vocationally, if at all, for homemaking is yet in doubt, especially when they are followed only from two to five hours per week. In most instances it is probable that the training thus given should be regarded as effective rather on the side of liberal than of vocational education.

(*d*) The study of household arts (with the aid of suitable textbooks, laboratory experimental work, etc.) can obviously be made a valuable feature of liberal education, in the sense that such study can improve standards of utilization and develop larger ideals of home life. Women exert an exceptionally large influence on standards of consumption in the fields of artistic products, economic utilities, and specialized service. For this reason, it is especially important that as a phase of their general education they should be instructed and trained as to most effective standards of utilization.

11 (Definition). **Household arts education** includes all those forms of instruction and training based upon the occupations of the home or household, and which are designed to promote higher standards of appreciation and utilization in the field of the activities associated with homemaking, to promote right conceptions of the social importance of the home as a nursery of childhood and a haven for the wage-earners of the family, and to show wherein the various arts and sciences have practical application in domestic life. Hence, household arts education can be made a large factor in the liberal education of womanhood.

12 (Definition). **Nautical education** is the term used to designate those forms of vocational education, the controlling purpose of each of which is to train youths for such occupations as those of the fisherman, the sailor, the ship captain, and the like. These forms of training have not yet been clearly differentiated in the educational practice of America. A few special nautical schools of a technical character exist, and in the United States naval service facilities for training seamen are provided.

III. Pedagogical Phases of Vocational Education

1. **Major and minor phases.** — Vocational education, as respects its organization for teaching purposes, presents in almost every instance two quite distinct major phases and one minor phase; namely, the concrete, practical, or manipulative major phase; the technical or theoretical major phase, the subjects of study under the latter head being sometimes referred to as the "related subjects"; and a third relatively minor phase embracing those studies and practices designed to promote vocational ideals, general insight, and other knowledge and appreciation which are pertinent, but not directly necessary for the particular vocation for which training is being given.

In the training of the dentist there is required: (*a*) Practical work in filling, etc.; (*b*) theoretical study of anatomy, etc.; and (*c*) possibly some study of the history of dentistry, of the practice of dentistry in other countries, of the need on the part of the dentist of offsetting the strains of his calling by suitable exercises for the sake of his own health, etc. In the training of the teacher there is required: (*a*) Practice in teaching; (*b*) the study, from the standpoint of the teacher, of the subjects which she will expect to teach, as well as methods of teaching, school hygiene, etc.; and (*c*) the history of educational administration, the lives of noted educators, etc. In the training of the machinist is required: (*a*) A large amount of practical manipulative work in constructing valuable objects from steel or iron; (*b*) study of such phases of mathematics, drawing, mechanics, etc., as apply to the practice of the machinist; and

(*c*) possibly some study of the history of the evolution of the iron and steel industries, of the distribution of these industries in various countries, of special hygiene for metal workers, etc.

(*a*) The foregoing are the phases of a program of systematic vocational education. It is recognized, of course, that a program of liberal or general education may be carried on side by side with a program of vocational education. A student might give half his day to vocational education and the other half to liberal education; or he might give one week to the one and another week to the other. A more common arrangement is to have the student give the best part of his working day to vocational education, with provision made for some cultural or civic studies, exercises, or participation, in marginal time. For example, the Massachusetts program permits from 10 per cent to 20 per cent of the day to be given to cultural training. This may be in English literature, music, or other lines of interest and importance.

(*b*) The problem of the proper combination of general with vocational education is one to be determined on the basis of aims and the requirements of efficient practice in each field, taking due account of the economic necessities of the learner. It is contended in some quarters that, if general or liberal education be blended with vocational, neither form becomes efficient. The question as to how far the two forms may be adjusted within a given day or other period efficiently must be determined by the experiment.

2 (Definition). **Basic vocational education** includes both major and minor phases, all so coördinated as to produce a desired total of vocational competency.

Extension vocational education is frankly one phase only, based upon the assumption of the competency of experience in productive work or training under other agencies to give other phases.

Technical instruction can be properly designated as vocational (for one phase) when it can be shown that for a substantial proportion taking it, valuable vocational powers are an outcome.

Few examples of genuinely basic vocational education in

schools are yet available. The best schools of medicine, elementary school teaching, and stenography give nearest approximations.

3 (Definition). **The concrete, practical, or manipulative phase of vocational education** in any occupational field includes all phases of learning through actual and direct participation in the practical processes characteristic of the vocation itself.

The following are examples: The prospective physician obtains concrete training through his hospital service, the teacher in his practice teaching, the engineer in actual field work, the journalist by serving as reporter, etc. Persons preparing for the commercial callings are expected to receive concrete or practical training through typewriting and stenography of a presumably practical nature made a part of the course of instruction through various types of exercises in salesmanship, the undertaking of practical work in accounting, etc. Manipulative or concrete work in agriculture as a means of training is provided through having the learners actually engage in the raising of crops, on a large or small scale, participation in harvesting and other practical work during summers and vacations, the care of domestic animals as a part of the animal husbandry course, etc. In various forms of vocational industrial education, practical work is provided through having prospective machinists manufacture parts of the equipment of the school, through the manufacture of salable products, etc.; prospective dressmakers spend a part of their time in making a salable product, etc. Practical or manipulative work in homemaking involves the preparation of meals, the actual making and repair of garments, the care of children, etc.

Concrete, practical, or manipulative work in vocational education may be (*a*) on a non-productive or (*b*) on a productive basis. Productive manipulative work may involve no compensation to the student worker or regular compensation to him. In general, modern pedagogical theory favors productive work as against non-productive work, where practicable. The distinction is this: Non-productive work is not commercially profitable; when the pupil is through, his product is laid aside or

destroyed. Productive work is commercially profitable. Its results are used to increase the equipment of the school itself, to render service in the schools of the local community, or to be sold. Again, students who do productive work which is used in the school or sold may not be compensated for the same on the ground that it is their partial contribution toward the cost of their education, or they may receive a small wage for the same. Pedagogical theory favors the latter plan, where practicable, because of the greater interest evoked and because the environment produced is similar to that in which the pupil will later follow his vocation.

4 (Definition). **Productive practical work** includes all forms of practical work as a part of vocational education, the material results of which are of evident value to society.

The services of internes in hospitals, of prospective teachers in training schools, of boys doing their productive work on a home farm, of shopworkers in city schools doing repair work on school buildings, of homemaking pupils taking charge of the preparation of meals for schools, etc., all represent forms of productive practical work.

5 (Definition). **Non-productive practical work** includes all practical work as a part of vocational training the output of which can be put into no practical use.

Examples: Business college students keeping books, doing typewriting, etc., of a non-marketable character; agricultural school students raising products which are not marketed or consumed; engineering students making extensive surveys the results of which are of no commercial value; shop students constructing articles that are simply kept for exhibit or destroyed, etc.

(*a*) Vocational education in the past was carried on largely in shops, and through other commercial vocational agencies, under a more or less organized system of apprenticeship. The pupil learned almost exclusively through actual participation in concrete work. His tasks were sometimes graduated as to difficulty, either by chance or design. The pupil learned mainly through imitation, his superior sometimes showing him the "tricks" and various devices. Vocational education under

apprenticeship is usually more effective on its practical than on its technical side.

Many examples still survive of learning through apprenticeship. A locomotive engineer obtains his training first as a fireman. A nurse frequently obtains all of her training through actual nursing in a hospital. Until very recently, many teachers in England obtained their training solely as apprentices, being known as "pupil teachers." In many skilled trades, organized apprenticeship still survives, in one form or another. Leadership in many vocational fields is reached through promotion from the lower stages — essentially a method of learning through actual participation which is without the direction characteristic of apprenticeship.

(*b*) Because recognition of the value of actual participation in concrete work took place early in the development of vocational education in schools, endeavors have frequently been made to employ substitutes for participation in the actual processes themselves where participation in the commercial occupations is difficult or impracticable. This may be called practical work on an "exercise" basis.

The following are examples: The law student practices in a moot court. The engineering student carries on surveys around the campus. Commercial schools devise imitation money, set up receiving windows, etc., and carry on "make-believe" business having some semblance to actual business. The agricultural student is given small plats on which to raise plants, or he shares in a form of "group" or "gang" labor directed by some teacher. The wood-working student is given exercises on lathes and other machines, the products of such exercises having no commercial value.

(*c*) Several problems are still unsolved as regards concrete work in many lines of vocational training. Can commercially practical work be presented in properly graduated stages? What shall be the unit, or project, in the practical work? Can practical work in a school take the place at all of practical work under commercial conditions apart from the school? Is it economically desirable that the practical work of a school be sold in open market? Shall the pupil be compensated for his

practical work? How shall the practical work be related to necessary technical training? How far shall the student be permitted to subdivide his practical work in the direction of becoming a specialist, as in machine-shop working, textile working, etc.?

6 (Definition). **Apprenticeship** is a term here used to include all forms of systematic vocational education through the participation of the learner, under the direction of skilled workers in the actual work of various productive occupations.

Well-known examples are the apprenticeship arrangements in the various skilled trades. Other examples, not always included under the term, are the "pupil-teacher system," formerly prevalent in England, the training of nurses in hospital practice, the training of commercial experts in commercial houses through systematic advancement from one type of employment to another, the methods employed in the Middle Ages of training knights and priests, the methods formerly prevalent by which physicians, lawyers, etc., first took service as youths under older practitioners, etc.

Apprenticeship as a means of vocational education is generally believed by students to be declining in possibilities and importance. It has almost disappeared in all the professions except nursing, acting, and journalism. In the industries the substitution of manufacturing processes for crafts production, and the subdivision of work made possible, has greatly diminished the field for apprenticeship training. In occupations calling for increased amounts of technical knowledge (various electrical trades, plumbing, gardening, etc.) the methods of apprenticeship prove unequal to the task of giving, in satisfactory form, technical instruction. Evening vocational schools were first organized to compensate for this deficiency.

7 (Definition). **Technical, theoretical, or "related subject" phases of vocational education** include those readings, lectures, and studies and exercises in mathematics, science, drawing and art, laboratory experimentation, etc., which furnish organized knowledge of, and practical insight into, the so-called "technical aspects" of vocations. The technical studies appropriate to any vocation can only be determined by a study of the requirements of that vocation itself.

The following are examples of the technical knowledge required in certain vocations: For the physician, physiology, special phases of chemistry, materia medica, etc.; for the electrical engineer, certain phases of applied mathematics, drawing, the principles of electricity, some of the principles of mechanics, etc.; for the farmer, agricultural science, embodying selected phases of botany, soil physics, chemistry of fertilizers, hygiene of domestic animals, meteorology, accounting, exchange forms of mechanics as applied in farm machines, etc.; for the bookkeeper, some phases of mathematics; for the house carpenter, certain phases of drawing, mechanics, building materials, and mathematical calculations; for a teamster, local geography, mechanics of vehicles, hygiene of domestic animals, etc.; for the dressmaker, certain phases of art, drawing, mechanics, etc.; for the homemaker, specific phases of food chemistry, decorative art, simple forms of mechanism, etc.

(*a*) With regard to the great majority of vocations, no satisfactory analysis has yet been made of the related technical studies which are pertinent and valuable. But it has become evident that the content of technical training which actually functions in many vocations is much less than has been assumed. The inherited traditions of academic education have caused many people to believe that all of the phases or parts under a given inclusive subject should be studied, notwithstanding the absurdities to which this contention leads. For example, botany and chemistry as separate abstract subjects are sometimes taught in agricultural schools; prospective mechanics are induced to study algebra and geometry; and a prospective house carpenter is urged to take a general course in mechanical drawing, although, in each case, the successful workers in these fields will employ only very limited and special phases of these subjects. It is obvious that progress in the development of programs of vocational education will involve a clear differentiation of the technical training needed in each vocation. Experience will probably show that so-called "foundations" in general knowledge of abstract scientific, or mathematical, or art subjects, are often relatively valueless for vocational purposes.

(*b*) In some discussions of vocational education the related technical studies are sometimes called the "academic subjects." This usage is confusing, and should be discouraged. The word "academic" should be restricted to the field of general, or liberal, education.

8 (Definition). **A technical school** is a school designed to give technical knowledge only, as that is involved in some recognized vocation or group of related vocations.

The following are examples: Schools of law and medicine originally taught only the more theoretical phases of these professions. Only in the more recent stages of their development are they introducing practical work also as a means of instruction. Schools of engineering originally taught chiefly engineering mathematics, drawing, science, etc., giving little or no practical work. Some schools of technology still confine themselves to this; but in many others shopwork, summer-camp work, compulsory practical service in mines, etc., are now added, to give necessary practical experience. The earlier agricultural colleges and schools taught primarily the mathematics and sciences supposed to constitute a basis of knowledge for agricultural practice. Some commercial schools offer only informational studies regarding commercial operations. Technical high schools teach chiefly certain phases of applied science and art, illustrated with laboratory practice. Much of the homemaking taught in contemporary high and other schools, under such heads as "household arts," "domestic economy," "household economics," etc., is primarily an attempt to give technical knowledge only of the processes involved in homemaking.

(*a*) Technical education had its origin and took its shape primarily through the attempts of society to supplement apprenticeship as a means of vocational training, the apprenticeship giving practical experience, but not related technical knowledge. Evening vocational schools, as well as day schools, came into existence, first, to give related technical knowledge.

The first medical colleges, as well as other professional schools, in many instances assumed that the student had already served an apprenticeship as an assistant to a practitioner.

(*b*) The value of technical education when administered

without connection with practical training must be considered solely with reference to its actual efficiency in contributing to a complete scheme of vocational education. In some of the higher fields, as engineering, technical knowledge alone may constitute a very valuable foundation, whereas, in many of the trades, it may, if unaccompanied by practical experience, be almost valueless. The entire matter is one requiring further scientific study.

(*c*) Secondary technical schools as now found in the industrial, agricultural, and commercial fields can only occasionally be called "vocational schools" in the sense used here, because the instruction in them is not adjusted to the requirements of a distinctive vocation. Commonly their teaching is of a general nature, unrelated to the actual requirements of callings as now organized. It is probable that their teaching does not generally "function" in direct vocational power. In a few cases the effects of the training given may be vocational, as in the case of draftsmen and analytical chemists.

(*d*) Technical schools sometimes offer studies the actual value of which may consist in the establishing of ideals and appreciations. A normal school, for example, may offer the history of education, which is not properly a technical study, but the study of which may give rise to ideals of teaching. Such a study properly belongs under the head of "General vocational studies."

9 (Definition). **General vocational studies** are those which, when considered with reference to a particular calling, seem to lead to the development of ideals, general interest, and social insight, but without contributing to specific forms of useful knowledge, skill, or power.

The following are examples: The physician may study the history of medicine or the hospital practices of the past, or he may read the biographies of such men as Jenner, Pasteur, and Lister. The engineer may study economics and the rise of modern industry, labor problems, and geological science. The teacher may study general psychology and the history of education. The prospective machinist may study the general literature of his subject, the history of the evolution of steel

working, industrial hygiene as related to his calling, etc. The prospective clerk may study commercial geography, the history of exchange, and modern banking problems. The prospective homemaker may read of the homes of the past or of the present in other lands, etc.

(*a*) It is obvious that in and about any particular calling a large amount of literature may be gathered which, properly used, should do much to promote ideals, to give insight into the social relationships of the calling, to develop an appreciation of its hygienic and psychological aspects, and to lay the foundations for an appreciation of the possibilities of advancement for the worker.

(*b*) The actual value of so-called general vocational education is still open to question. It is exceedingly easy to organize and administer various forms of "general vocational" education in accordance with academic traditions. It may lead to "industrial intelligence," a quality which, if it exists as ordinarily conceived, is much in demand. It is probable that the actual value of general vocational education is very dependent upon the degree to which it has been preceded by foundations in practical experience and definitely related technical studies.

IV. Pedagogical Devices in Vocational Education

Vocational education requires the development of new and sometimes unfamiliar pedagogical devices, most important of which, for the present, are those signified by the terms "projects," "short unit course," "correlation of technical and practical training," and "productive work."

1 (Definition). **A project** in vocational education is a definite unit of instruction which combines practical or manipulative achievement with a definite enhancement of power to apply related technical knowledge.

(*a*) Practical work alone may correspond to what is known as a "job" in many lines of industry. A project is an "educational" job; it has educational value, and it ought to have economic value.

(*b*) Growth in capacity to apply related technical knowledge

may involve application of general knowledge already obtained, as where a student in carpentry learns to make further use of his previously acquired knowledge of board measure; or it may involve the acquisition of new technical knowledge, as that is immediately related to the job in hand.

(*c*) A complete project usually involves the following steps on the part of the learner:

1. Purposeful consideration of the conditions to be met in undertaking the job.
2. Planning how to meet these conditions, in terms of the materials of the trade, trade operations, suitable tools, etc.
3. Preparation of needed preliminary working aids in conventional forms, such as drawings, working plans, etc.
4. The performing of such calculations as may be necessary, including figuring cost, ascertaining amount of stock to be used, and other conditions.
5. The execution of the job as planned, and in accordance with specifications.
6. The submission of a proper report of the job.
7. In some cases, a disposal of the project on an economic basis.

The following are examples of projects: An engineering student employed to lay out a grade as required by a railroad; a hospital interne given charge of a case; a teacher taking full charge of a group of pupils; an agricultural student undertaking to raise an acre of corn, and to market the same, or to take charge of two dairy cows for a year, including the proper care, feeding, and milking of these; an industrial-school student undertaking a definite job of work as this is carried on in commercial enterprises; a pupil in a trade school making a dress, or a group of pupils in a school of carpentry erecting a cottage; a student in homemaking preparing the family breakfasts for a month, etc.

(*d*) Projects may be subdivided into major and minor projects, the latter being subdivisions of major projects.

For example, a boy in an agricultural school might undertake to raise an acre of potatoes, this being his major project. For practical purposes, he would subdivide this into a series of

minor projects, each one a unit in itself. A class of pupils in an industrial school might undertake the construction of a machine, each boy having some one piece of work assigned to him as his minor project, or even some one operation. A girl undertaking the preparation of the family breakfasts for a month might make her minor project temporarily the study and practice required in preparation of one dish.

(*e*) It is obvious that projects may be individual or coöperative. It is conceivable that in industrial schools, large coöperative projects might be undertaken by a class, with appropriate subdivisions, each subdivision forming a project by itself.

(*f*) The project has no definite counterpart in academic or general education. Much of the work in general education was formerly organized on the "lesson unit" basis. In such subjects as mathematics, history, geography, English, it is now organized on the "topic unit" basis. The study of a classic selection in a foreign language, and the execution of a manual training enterprise provide the nearest analogies.

(*g*) The alternative to the project organization of vocational work is, on the one hand, the job as the unit of practical work, and, on the other, the logically organized course of instruction in technical subjects.

(*h*) In many lines of vocational education, satisfactory series of projects have not yet been developed. Obviously, the development of a project system of organizing vocational work presents very great difficulties, and especially to persons prepossessed in favor of the logical organization of technical subject matter.

2 (Definition). **The short unit course** is an intensive form of training and instruction which is intended to meet, in a limited number of lessons, a specific need of a particular group of learners. Each unit deals with some one teachable phase of a trade or other occupation, and is complete in itself.

The short unit course has thus far been worked out primarily only in the fields of agricultural, industrial, and homemaking education. In agriculture, short unit courses are found in connection with extension work, where, in the course of a week or a

few weeks definite instruction is given in both the manipulative and technical phases of some one specific field of practice in agriculture or animal husbandry. In evening industrial schools the short unit course is designed to give quite specific instruction, either of a manipulative or technical character, in some one phase of the trade or occupation being followed, or to be followed. It is assumed that the short unit course, when technical in character, will be related to the practical work already being followed by the learner.

The following are examples: Five lessons in the use of spraying; 5 lessons in orchard cropping; 5 lessons in farm accounting; 5 lessons in grafting; 10 lessons in kiln drying of lumber; 10 lessons in the use of the buzz planer; 5 lessons in the use of the sliding rule; 6 lessons in thread cutting; 20 lessons in cotton sampling; 5 lessons in the making of a shirt waist.

3 (Definition). **The correlation of technical studies and practical work** includes such pedagogical devices as involve the integral relation of technical studies with jobs of practical work as found in the project method of organization.

The following are examples: Mechanical drawing may be taught as a general subject, apart from its particular application to the work of the machinist, house carpenter, or dressmaker (probably general, or general technical, rather than vocational); or, as opposed to this, it may be taught in intimate correlation with the practical work of training for various specific vocations. A pupil studying house carpentry may acquire power in mechanical drawing through exercises closely adjusted to the practical work which he is taking from day to day. Different forms of drawing would therefore be required for the machinist, the plumber, the electrician, etc.

Such sciences as botany and zoölogy may be studied by a prospective farmer, independent of their particular applications in agriculture (therefore general education). As opposed to this, the student of agriculture may undertake to raise an acre of potatoes, and in conjunction with this problem study those phases of plant and animal life which are essential to the success of his enterprise.

A girl may study the mechanical principles of movement of air currents as a matter of physics (general). As opposed to this, she may be instructed in the practical problems of making various types of stoves burn effectively, and in conjunction with this problem such matters relating to the circulation of air currents in stoves as will reinforce her practical experience.

In view of academic traditions, it is not difficult to teach various sciences, as well as mathematics and drawing, as separate abstract subjects. It is now generally believed that for most pupils, at least, the learning of these subjects in the abstract does not contribute to efficient vocational training. On the other hand, the integral correlation of phases of these technical studies with practical work presents obvious pedagogical difficulties, but its vocational value is unquestioned.

V. Types of Schools for Vocational Education

1. **Vocational schools classified.** — Vocational education in schools, like other forms of education, may be carried on in day schools (in which the student is under the control of the school for substantially all of his working time); evening schools (in which the student is regularly employed, and is under direction of the school only for his evening hours); or continuation schools (in which the student is regularly employed, and is under control of the school only for a limited number of hours taken from his working day).

These schools may be further classified as follows:

Day vocational schools:
- (*a*) Unified, or combined.
- (*b*) Dual, or coöperative —
  - (1) Full responsibility.
  - (2) Part responsibility.

Evening vocational schools:
- (*a*) Preparatory.
- (*b*) Extension.

Continuation vocational schools:
- (*a*) Preparatory.
- (*b*) Extension.

2 (Definition). **A day school for vocational education** is one which requires that the pupil be under the direction of the school for substantially the greater part of each working day, for at least five days in each week, for the major portion of each year.

Day vocational schools are of several types, according as the practical or productive work in them is done under the same roof and in direct relation to the technical instruction, or separately from it. Among these are the "unified" or "combined" type, and the "dual" or "coöperative" type.

3 (Definition). A day vocational school of the **unified** or **combined type** is one in which all phases of a complete (or basic) program of vocational education are carried on under one roof, or general building, under the immediate control and direction of the school.

The following are examples of unified, or combined, day vocational schools: A medical college immediately controlling its own hospital, and opportunities for clinical and practical work; an engineering college possessing its own shops, summer camps, mines, etc., for experimental and practical work; an agricultural school owning its own farms, gardens, and live stock; a commercial school with differentiated opportunities for various forms of practical work in accounting, typewriting, salesmanship, etc.; an industrial school having its own productive shops and other facilities for constructive work; a homemaking school owning a house or apartment in which practical housekeeping is carried on, including such branches as cooking, sewing, laundering, care of rooms, nursing, etc.

It is a present tendency in vocational education to insist that the practical work given in training shall be of a productive, commercially profitable, and marketable character. Hence, we have instances of medical colleges managing serviceable hospitals; normal schools using as practice schools public schools in the community; schools of carpentry leasing or buying land, erecting buildings, and selling the same; dressmaking schools marketing their product; electrical workers' schools doing necessary labor about school buildings; printing schools taking orders on a commercial scale; homemaking schools supplying meals and other products for sale or use outside; etc.

A few instances exist where day vocational schools have complete control of practical work carried on within the confines of an industrial or other establishment at some little distance, but which is, nevertheless, completely under the control of the instructing force of the school.

4 (Definition). A day vocational school is of the **dual** or **coöperative type** when the complete program of vocational training involves the coöperation or other relationship of two agencies, one, more specifically the school, giving technical and related instruction, and the other an institution or agency having commercial or practical ends in view, but placed in a coöperative relationship as a means of furnishing opportunities for practical experience to properly prepare pupils.

The dual, or coöperative, day vocational school is of two distinct types, according as (*a*) the authorities in control of the school also control the adjustment and assignment of the practical and productive work as this may be used for educational purposes, or (*b*) the control of the practical work for learners is independent of the school authorities.

5 (Definition). A day vocational school of the dual or cooperative type is a **full-responsibility school** when it has the direction of the arrangement of practical work for learners when this is carried on in independent establishments.

The following are examples of day vocational schools of the coöperative type having full responsibility: A medical college sending its students into hospital practice in a hospital under other management, but with arrangements whereby the work done by the students shall be completely under the direction of the college authorities; a normal school sending its students into the public schools of a local community, the students remaining completely under the direction of the normal school authorities; a group of engineering students taking a job of practical work, to be carried out wholly under the direction of the college authorities; an industrial school sending a group of boys into an industrial establishment, where equipment and space are placed at their disposal for carrying out productive work, the actual program of such work being under the direction of the school authorities; an agricultural school, the pupils in which carry

on, on their home farms, practical productive work under the complete direction of the school.

6 (Definition). A day vocational school of the dual or cooperative type is a **part-responsibility school** when the actual work of students sent into other establishments for purposes of practical training is controlled by, and largely under, the direction of the industrial establishment itself.

The following are examples of the dual or coöperative type having part responsibility: A normal school sending its students into public schools where these students are not under the control of the normal school, for the sake of practical experience; an engineering school arranging that its students shall have opportunities for practical work on railroads, in mines, and elsewhere, in the capacity of assistants or laborers; a commercial school sending its students into offices or mercantile establishments during busy seasons or at other times, for practical experience; an industrial school arranging the group of its students who shall, during alternate weeks, or at other regular intervals, work as apprentices, assistants, or laborers in industrial establishments; an agricultural school sending its pupils out on farms for practical experience, or in coöperation with parents or others in carrying out practical processes on the farm; a homemaking school sending its pupils into their own homes to carry on the home processes, subject to the requirements of the home itself.

(*a*) The day vocational school of the coöperative "part responsibility" type must not be confused with the "part-time" school, which receives pupils from industrial establishments where they are already employed. (This type of school will later be defined as a modified form of continuation school.) At times the actual distinctions in character between the operations of the two schools may be difficult to define; but the essential difference is determined by the fact that in one type the pupils go from the school to the employing establishment with a view to obtaining practical experience, whereas in the other type the pupils go from the employing establishment to the schools for the purpose of obtaining supplemental training. The latter is properly "trade-extension training," discussed under continuation education.

(*b*) The efficiency of any form of dual or coöperative vocational education depends upon the degree to which the practical experience obtained in the shop and the technical instruction obtained in the school are coördinated, correlated, and integrated. In some existing so-called part-time plans the practical work of the pupil is only remotely related to the technical instruction. Such an arrangement results in poor vocational education. An agricultural student spending his summers on a farm will obtain valuable practical experience, but much of it, being unrelated to his school work, will not constitute a valuable part of vocational education. Technical instruction in homemaking, without practical experience under the direction of the school, is but poorly supplemented by the miscellaneous practical experience obtained at home. To send a commercial pupil into an office or mercantile establishment during a busy season is much better than no practical experience during the course of school training; but such practical experience will be related only remotely to the concrete teaching. Normal schools find the practice of sending students into schools not under their direct control of doubtful value, and in any case helpful only in the last stages of their vocational training.

(*c*) Theoretically, vocational training under coöperative or dual arrangements should ultimately prove the most effective, if proper coördination of the separate agencies can be procured, because then the required practical experience is obtained under genuinely commercial conditions, a situation most difficult to develop in a unified day vocational school. Satisfactory coordination of effort between school and commercial establishment for dual or coöperative vocational training is now difficult to obtain, partly (*a*) because commercial and industrial establishments conducted for profit are indisposed to advance learners through successive stages of practical work, and (*b*) because teachers of technical studies are indisposed or unable to adjust technical instruction to the requirements of practical experience, preferring to teach technical studies on some purely logical basis. In time the following two methods of meeting these difficulties may be developed:

(1) Vocational schools having groups of pupils in need of, and ready for, practical experience may offer the services of these to industrial establishments on suitable terms, on condition that these pupils, under the supervision of instructors, be allowed to fit into practical work at such places and to such degrees as will be educationally profitable, while at the same time involving no economic loss on the part of the employer. (This arrangement would be especially suited to pupils from 14 to 18 years of age.)

(2) Teachers of technical subjects will be required to adjust their instruction so that, as their students who are regularly employed in establishments are advanced from stage to stage of work, the technical teacher will adjust his training to the requirements of the practical work. This will usually require that subjects of study based upon purely logical foundations in technical subjects be replaced by short unit courses and exercises based upon the practical work of the student.

7 (Definition). **A "factory" vocational school** is one located in some adjunct capacity to a productive enterprise already in operation.

Training classes in large factories, large farms, on shipboard, in army camps, shipyards, banks, and department stores are examples.

8 (Definition). **A vestibule school** is a factory school designed to give preparatory training or instruction to new employees, the latter usually being already on the pay roll.

9 (Definition). **An upgrading school** is a factory school designed either to improve the already employed worker's productive powers in his present department or to prepare him for advancement to a better paid or otherwise more advantageous department.

10 (Definition). **Evening vocational schools** are schools in which the hours of instruction lie outside of the customary working day. Evening vocational schools are of two types, extension and preparatory.

11 (Definition). **The extension evening vocational school** is a school in which a young person already employed in some occupation receives, during evening hours, vocational education

in subjects closely correlated with the work which he follows during the day, and calculated to assist him toward greater efficiency or more advanced work in that calling.

The following are examples: A young man following the trade of machinist, receiving an evening-school training in mechanical drawing and calculations related to his work, or practical instruction on machines closely related to those he operates during the day, or calculated to give him more technical knowledge of them; a man already engaged in raising poultry, obtaining in night classes technical instruction in the more scientific phases of poultry raising; a man engaged during the day in the practice of medicine, law, or engineering, studying in an appropriate evening school subjects related to his professional work; a domestic employed in a home, studying more advanced phases of cooking and sewing, in evening classes.

12 (Definition). **Preparatory evening vocational schools** are those in which is offered vocational training unrelated to the occupation followed by the student during the day.

Few satisfactory examples are yet available as to profitable evening preparatory vocational education. The time is usually too short, the student too tired or uninterested, to make satisfactory progress. The following examples are suggested: Girls in textile mills studying homemaking, the latter work being divided into short units, such as shirt-waist making, the preparation of lunches, laundering, etc. (as now provided in special legislation in Massachusetts); a bookkeeper taking machine-shop practice, with a view to becoming a trained worker upon a special machine; a clerk studying, in an evening law school, for the purpose of passing bar examinations.

It is important to consider how far preparatory work in evening vocational schools may be developed in the future on what is known as the "short unit" basis. The most successful extension work in evening schools of a definitely vocational character is now organized on the short unit basis, which means that the learner is enabled to acquire skill in a particular process, with a particular machine, or to learn how to solve certain problems or to use certain devices, the necessity for which appears in connection with his daily work. It is possible that in

evening trade preparatory schools similar results can be procured by a strictly practical "short unit" organization.

13 (Definition). **Continuation vocational schools** are schools which are attended for a limited number of hours each week, within the customary working day, by persons regularly employed.

(*a*) Continuation vocational schools, like evening vocational schools, may be "trade extension" or "trade preparatory" schools.

(*b*) In practice evening vocational schools are adapted to workers upward of 17 or 18 years of age, while continuation vocational schools are primarily adapted to young workers from 14 to 18 years of age.

14 (Definition). **Extension continuation vocational schools** are schools giving instruction or practice directly related to the occupations being followed by the pupils.

If the time given to the school is considerable — perhaps alternate days or weeks, or a half of each working day — then such schools are often called "part-time schools." Many, if not all, of the great variety of occupations followed by young persons offer opportunities for supplemental or extension training in vocational schools on the continuation basis. The following are examples: A messenger boy learning the geography of the community in which he works in order to improve his efficiency as a messenger; a machinist being taught in short unit courses a variety of devices and operations essential to his advancement or greater efficiency; a salesgirl being taught devices of salesmanship; a farmer being taught particular phases of tillage, animal husbandry, etc.

15 (Definition). **A preparatory continuation vocational school** is one which undertakes to teach the student a new trade or other occupation, or to give him an essential part of the training required for such trade during hours in which he is in attendance.

16. **Modified forms of continuation vocational education.** — Various modified forms of continuation vocational education exist, according to the character of the occupation followed and the time available for related study.

Part-time vocational education includes plans whereby young people regularly employed are released for regular periods, sometimes alternate weeks, in order to obtain instruction and practice in matters related to their occupations. Farmers during dull seasons attend the short courses offered under extension agencies or in agricultural colleges. Apprentices are sometimes sent away to other establishments for temporary employment, primarily to learn new or related processes. Physicians in practice sometimes engage in hospital practice for short periods, in order to obtain new knowledge. In Germany and England the more capable workers in certain technical trades are sent to special schools for limited periods to acquire mastery of mathematical and technical processes needed in order to become foremen or overseers.

" Improvement " or " general " continuation schools, not of a vocational character, are common in Germany and are found at present in two or three states of the United States. These aim to utilize the continuation period of instruction to further general education.

VI. Administration of Vocational Education

The administration of publicly supported vocational education involves the same problems as those found in the public control and direction of general education. The relationship of the administrative organization of general education to the administrative organization of vocational education introduces questions of " dual " versus " single " control. The types of schools and the internal organization of schools introduce problems of differentiation of schools, and divisions and departments within schools.

1 (Definition). **Dual administrative control** of education exists when, either in the state or in the local community, or in both, the agencies for the control of vocational education are distinct from those for the control of general education.

Examples: In Massachusetts for several years a commission on industrial education had complete authority over industrial schools on behalf of the state, its operations having no con-

nection with those of the existing state board of education. In a few Massachusetts communities, separate boards of trustees are in charge of industrial schools.

2 (Definition). **Single administrative control** is found when vocational schools are organized and supervised by the same authorities as those charged with responsibility for general education.

In Massachusetts at the present time, the state board of education exercises certain functions alike with reference to vocational and general education. In most Massachusetts communities, a local school committee, working through a superintendent of schools, is in charge of both forms.

In practice, neither dual nor single control is found in a pure form. Experience shows the wisdom of arrangements whereby, in communities properly appreciative of vocational education, there shall be ultimate single control, but with a differentiation of specific agencies for the direction and supervision of each form of education.

For example, in Massachusetts a single board of education, working through a commissioner, supervises on behalf of the state vocational education and so much of general education as it is authorized to supervise under the law. Under the commissioner, however, is one deputy commissioner designated to deal with vocational education, and another deputy commissioner to deal with other forms. Wisconsin, Indiana, New York, Pennsylvania, and Connecticut present examples of more or less modified forms of control. In some instances, where separate local boards exist, the board for vocational education may be created by the board in charge of general education, or the two boards may have common membership.

3 (Definition). **A vocational school** is an organization of instructors, pupils, courses, buildings, equipment, etc., devoted to vocational education for one or more distinct vocations.

An analogy is found in university organization, where, under one general control, departments, or schools for the teaching of the various professions and the liberal arts exist.

4 (Definition). **A vocational department** in a vocational school is an organization of teachers, equipment, etc., designed to train young people for a single recognized occupation.

Thus, a vocational industrial school may have departments for the training of plumbers, pattern makers, cabinet-makers, printers, etc., and experience may show that very little of the actual training required for these different occupations will be alike or in common. A vocational commercial school might have departments for the training of accountants, stenographers, clerks, salesmen, etc. A department of "general instruction" in a vocational school is an organization of teachers, equipment, etc., designed to give the non-vocational instruction required in common by several departments of a vocational school.

5 (Definition). **A division in a vocational school** includes two or more departments dealing with related materials, and involving, to some extent, related processes.

Thus in a large vocational school there might be a woodworking division embracing such departments as pattern making, cabinet-making, and house carpentry; a machine-shop division; a printing division, etc.

6 (Definition). **A departmental advisory committee** in the administration of vocational education consists of two or more persons, preferably representing, respectively, employers and employees in a given vocational field, for which the department to which it stands in an advisory relationship is giving vocational training.

The successful administration of vocational education under public control requires the active coöperation of representatives of the occupations for which training is being given. A useful means to this end, where vocational schools are under the general direction of the regular school authorities, is the advisory committee consisting, in the main, of employers and employees in the particular industry for which a given department is offering vocational training. Good administration requires that the advisory committee shall be brought into intimate consultative relationship to all new proposals as to standards and conduct of vocational training in the department concerned. The responsible head of the department must, in an executive capacity, be responsible for securing the conditions which shall enable the advisory committee to be active and effective.

VII. Practical Arts Schools, Departments, and Studies

In private and public schools a variety of studies and practices have developed during recent years that may be described collectively by the words "practical arts." Various forms of practical arts education are to be sharply distinguished from vocational education. Experience proves that practical arts training, of one form or another, may make valuable contributions to general education. It is not yet evident that practical arts education, as ordinarily carried on, makes substantial contributions to vocational efficiency. It may be made to affect vocational choice and perhaps stimulate vocational ideals. Among the forms of practical arts education are these:

1. **Manual arts training in lower grades.** — Manual training in lower grades is that form of practical arts education in which boys and girls, usually during the work of the first six grades, have practice with a variety of exercises or projects resembling projects carried on in practical life.

This manual training includes whittling, clay modeling, paper folding, picture mounting, needlework, weaving, and a variety of other constructive activities within the range of the experience of children under 12 years of age. In this work, boys and girls usually do the same exercises, and these are taught by the regular class teacher.

2. **Manual training in upper grades and high schools.** — Manual training in upper grades and high schools, as the term is now used, applies mainly to wood and metal working, including at times printing, bookbinding, and various forms of constructive work as arranged for boys from 12 to 16 or 18 years of age. The term "industrial arts" is now preferred, inasmuch as the words "manual training" connote theories of formal discipline no longer accepted.

In this field of manual training, well-defined programs of bench, forge, and metal working are now found. This work is usually taught by departmental teachers.

3. **Household arts for upper grades and high schools.** — Corresponding to manual training for boys from 12 to 18 years of age are now found in upper grades and high schools a

variety of practical exercises in cooking and sewing, and occasionally in other homemaking fields, designed to give girls from 12 to 18 years of age insight and taste with regard to domestic operations.

In forms slightly, if at all, modified the same subject is called "home economics" and "domestic economy." Sewing and its allied lines are sometimes included under the term "domestic art," while cooking and its allied lines are sometimes called "domestic science."

4. **Agricultural arts education.** — In some elementary and high schools, exercises based principally upon tillage are now found as constituting a phase of general education. In some cases home gardening, school gardening, and laboratory work in agricultural science are added, as well as reading exercises regarding live stock, etc.

5. **Commercial arts or business education.** — In elementary and high schools a variety of studies and practical work in bookkeeping, typewriting, commercial paper writing, and the like have been introduced in recent years, but no real distinctions between "vocational" commercial education and "general" vocational education have yet been made.

6. **Practical arts high schools.** — Under the influence of the movement for manual training a variety of special forms of high schools have developed, each frequently with some special characteristics. They are variously known as "manual training high schools," "manual arts high schools," "mechanics arts high schools," "technical high schools," etc. A practical arts high school in Boston is organized for girls' work in household arts exclusively. Technical or manual training high schools frequently have departments of household arts for girls.

VIII. Prevocational Education

1 (Descriptive). Within the last few years the term "prevocational education" has been introduced into educational literature, apparently with several meanings.

(*a*) The term "prevocational education" sometimes refers to studies and practices which, while not constituting a specific

part of vocational education, nevertheless, are assumed to be a valuable or even essential preliminary thereto.

In a broad sense, ability to read and write is preliminary and essential to almost any form of vocational pursuit under modern conditions. Similarly, a knowledge of arithmetic is essential as preliminary to the commercial and many other callings. In professional education biology and chemistry, for example, are frequently spoken of as "prevocational" to the study of medicine; history and economics to the study of law; Greek and Latin to the study of theology; mechanical drawing and trigonometry to the engineering professions, etc. Similarly, it has been held that manual training or sloyd (tool work with wood and metals) can be "prevocational" to the mechanical trades. Whether any particular study "functions" as prevocational training can, of course, be determined only by observation and experiment.

(*b*) The term "prevocational education" at present seems more commonly to be used to designate programs of instruction and training designed to assist an individual in making an intelligent choice of an occupation, through giving him opportunity to participate in a series of practical experiences related to many vocations.

For example, it has been asserted that manual training courses are, or can be made, of value in enabling a boy to "find himself" as regards his natural aptitudes for some one of the tool trades. Similarly, it has been asserted that so-called "commercial" studies and practices as found in public high schools enable the youth to "find himself" as regards his aptitudes for some commercial calling. It has been claimed that students taking mechanical drawing frequently discover from this their qualification or lack of qualification for various trades in which mechanical drawing applies.

(*c*) The importance of prevocational education of the type described under (*b*) increases in proportion as intelligent vocational guidance develops, on the one hand, and varied opportunities for systematic vocational education are established, on the other. We may assume that, in time, in any urban community a large number and variety of departments of voca-

tional education will be open to a youth at 14 or 16 years of age. It will be important that the youth choose wisely the school which he shall enter. It is not economical on the part of a vocational school to admit a considerable number of persons who must early be eliminated because of innate or other disqualifications for the work selected. If programs of prevocational education can be developed which will accomplish this end, much good will result.

It has been suggested, for example, that through the seventh and eighth grades, instead of the present somewhat rigid courses in manual training, there should be presented to boys a large variety of opportunities to participate in constructive and practical work along industrial, agricultural, and commercial lines. The exercises and opportunities for practical achievement should be related as closely as practicable to various occupational pursuits as now followed. Considerable opportunity for election should be given, and for the early giving up of uncongenial forms of work. Good amateur standards should prevail in this work, rather than so-called "professional standards." The teachers should be persons possessing varied forms of skill and wide industrial experience, selected with a view to their capacity to advise boys wisely as to vocations in which they would probably succeed. Similarly, it is suggested that opportunities could be provided for girls to "find themselves" in homemaking, industrial, and commercial pursuits.

(*d*) The problem of the immediate future is to define the purposes of prevocational education, if useful purposes can be found, and then to adapt programs of practice and instruction to the realization of these ends.

2 (Definition). **Prevocational education,** as the term is most vividly used, includes any form of education designed to enable a youth to discover for which one of several possible vocations he is best fitted by natural ability and disposition, the program of instruction and practice for this purpose being based mainly upon actual participation on the part of the learner in a variety of typical practical experiences derived from the occupations involved.

IX. Vocational Guidance

1 (Descriptive). Vocational guidance represents an attempt (first through philanthropic initiative and support, and later appearing through agencies for public education) to lessen the misdirection of energy and general loss of effectiveness at present involved in the efforts of young persons, especially in urban centers, to find suitable employment.

The historic agency of vocational guidance has been the home. Under primitive and settled conditions, the occupation of the child usually followed that of the father. In the modern urban community, the home becomes less and less adapted to giving effective vocational guidance. There is also available, now, a large amount of organized knowledge as to hygienic conditions surrounding any given field of work, the requirements which such work makes for intelligence or special training, etc., which can be imparted by organized effort. As conditions now exist, youths are commonly unprepared to take advantage of the opportunities for becoming more efficient and for promotion.

2 (Definition). **Vocational guidance** includes all systematic efforts, under private or public control, and excluding the traditional activities of the home, the conscious and chief purpose of which is to secure the most economical and effective adjustment of young people to the economic employments which they can most advantageously follow.

Examples of the various means now employed, at least occasionally, for this purpose are: (*a*) Selected readings given under the guidance of the school, with a view to conveying information as to economic activities, the qualities demanded in the various vocations, etc.; (*b*) systematic reading and study of specially prepared pamphlets descriptive of the opportunities, requirements, etc., of various particular lines of employment — usually given under the direction of teachers; (*c*) individual or group conferences of pupils with teachers, for the purpose of discussing vocational opportunities, conditions required, etc.; (*d*) systematic study of young persons from the standpoint of their physical and intellectual make-up, with a view

to advising them as to lines of employment which they can most effectively enter; (*e*) "prevocational training" (see page 577), consisting of limited amounts of practical experience in connection with exercises taken from various lines of practical work, with a view to discovering the pupil's fitness therefor, or enabling him to discover his own more fundamental aptitudes and interest; (*f*) systematic study of various economic lines of employment, with a view to obtaining specific data to be used in advising young persons seeking employment; (*g*) maintenance of employment agencies for young persons in day or evening school, with a view to assisting them to obtain work in suitable occupations.

Vocational schools in general, in more or less organized forms, offer vocational guidance and act in a measure as employment agencies in placing their graduates. This is especially true of normal schools, industrial schools, commercial schools, technological institutions, and universities.

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